

SAMSON

GEOLOGICAL SURVEY OF MISSOURI.

ARTHUR WINSLOW, STATE GEOLOGIST.

BULLETIN NO. 2.

3229

A BIBLIOGRAPHY

OF THE

GEOLOGY OF MISSOURI

BY

F. A. SAMSON.

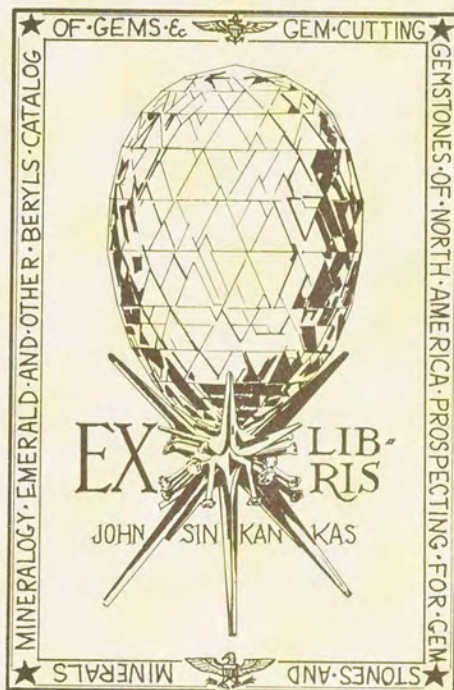
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Little Rock, Ark.

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BY

F. A. SAMPSON.

JEFFERSON CITY, MO.:
TRIBUNE PRINTING COMPANY, STATE PRINTERS AND BINDERS.
1890.

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3229

PREFACE.

With a broad foundation of knowledge should we build our monuments; past experience is the best guide to future practice; progress demands in the product of to-day an increment to the product of yesterday. From these three points of view must we regard as valuable the work which is here presented. A bibliography directs specifically to many sources of information, it leads to a knowledge of the outcome of others' efforts, it prevents duplication of labors and guides operations into productive channels.

The amount of work and time necessary for the compilation of such a volume of reference often deters from its preparation; titles have to be gathered from time to time as opportunity presents itself, many libraries in many places have to be visited, old book stores must be frequented and many a dusty book pile from chest, from top shelf, from garret, from cellar, must be overhauled and studied. Hence the Survey is fortunate in having donated to it, through the generosity of Mr. Sampson, the manuscript for this publication. It is the product of work persistently, though intermittently, carried on during several years; and the scope of the references and the amount of the material presented all testify to the studious zeal which sustained this work.

Over eight hundred titles of publications containing matter relating directly to the subject of the Geology of Missouri, will seem an astounding number to many. They are, however, not all independent works, and they vary much in the extent of their reference to the subject and in the qualities of originality and intrinsic value. In some cases, the nature and the extent of the reference is indicated in an accompanying note, elsewhere it can be conjectured from the title, while the relative merit of each can be judged of through a consideration of the nature and source of the publication and of the character and standing of the author.

With reference to the origin, as well as to character, these publications may be classed as follows :

1. PRODUCTS OF ORIGINAL INVESTIGATION
 - a. *With entire reference to Missouri.*
 - b. *With partial reference to Missouri.*
 2. COMPILATIONS FROM PUBLICATIONS OF ORIGINAL INVESTIGATION.
 3. INCIDENTAL OR DEPENDENT PUBLICATIONS.
- 1a. As products of original investigation with entire reference to Missouri, we would include, among the titles given, all of the reports of Missouri Geological Surveys, of the State Board of Internal Improvements, of the Bureau of Statistics and of the Smithsonian Institution; and we would further include a portion of the papers contained in the Annual Reports of the State University, in the reports of the State Board of Agriculture, in the United States Agricultural Reports, a portion of the papers of scientific societies and periodicals, and of the miscellaneous and mineral water publications, the total number under the heading being..... 206 titles
 - 1b. As products of original investigation, with only partial reference to Missouri, we would include all mentioned publications of the United States Geological Survey, a portion of the articles included among the reports of the United States Census, among the American State Papers, among the Miscellaneous Documents of Congress, among the United States Agricultural reports, among the reports of other State Surveys and among the papers of scientific societies and periodicals and miscellaneous publications, in all 266 titles
 2. Among compilations we would include the publications issued by the State Board of Immigration, a portion of the papers included in the reports of the State Board of Agriculture, in the Census reports, in the Miscellaneous Documents of Congress, and some of the papers published by scientific societies and in periodicals, a number of the miscellaneous publications and some of those relating to mineral waters, giving a total of..... 162 titles
 3. As incidental publications we would class Governors' addresses and messages, reports of Legislative committees and memorials to the Legislature, and also a portion of the papers contained in the Annual Reports of the State University, in the reports of the State Board of Agriculture, in the American State Papers, and among the Miscellaneous Documents of Congress, also the reviews and editorials among the publications of societies and periodicals, and a portion of the Miscellaneous titles. The total under this heading would thus be... 167 titles

Of publications of the State of Missouri there are 144 titles, of publications of the United States Government there are 65 titles, of publications of other State Surveys there are 13 titles, while of Miscellaneous publications there are 579 titles, more than twice as many as in all other classes together.

It would be interesting to enter into a more careful analysis of the contents of all these different publications, to separate the grain from the chaff, to distinguish between what is fundamental and what is out-

growth or superstructure. Many publications are products of others, some are repetitions, others with similar titles mark successive stages of knowledge; some are profound, rich in suggestion and of great educational value; others are superficial and barren. Neither the time available nor the means of access to these publications will, however, permit this, and such classification must be left to the individual. Pre-eminently as fundamental and educational, however, we must recognize the official and professional reports of State or National governments; the mass of information which these contain, presented officially and authoritatively, finds outlet and becomes disseminated through many channels. Some of the pamphlets, whose titles are given here, are but reproductions of portions of such reports popularized for special ends; others teem with extracts from or references to such official reports; while the daily or weekly issues of the Press, which are not catalogued here, distribute to the great mass of the people those results which can be turned to immediate use.

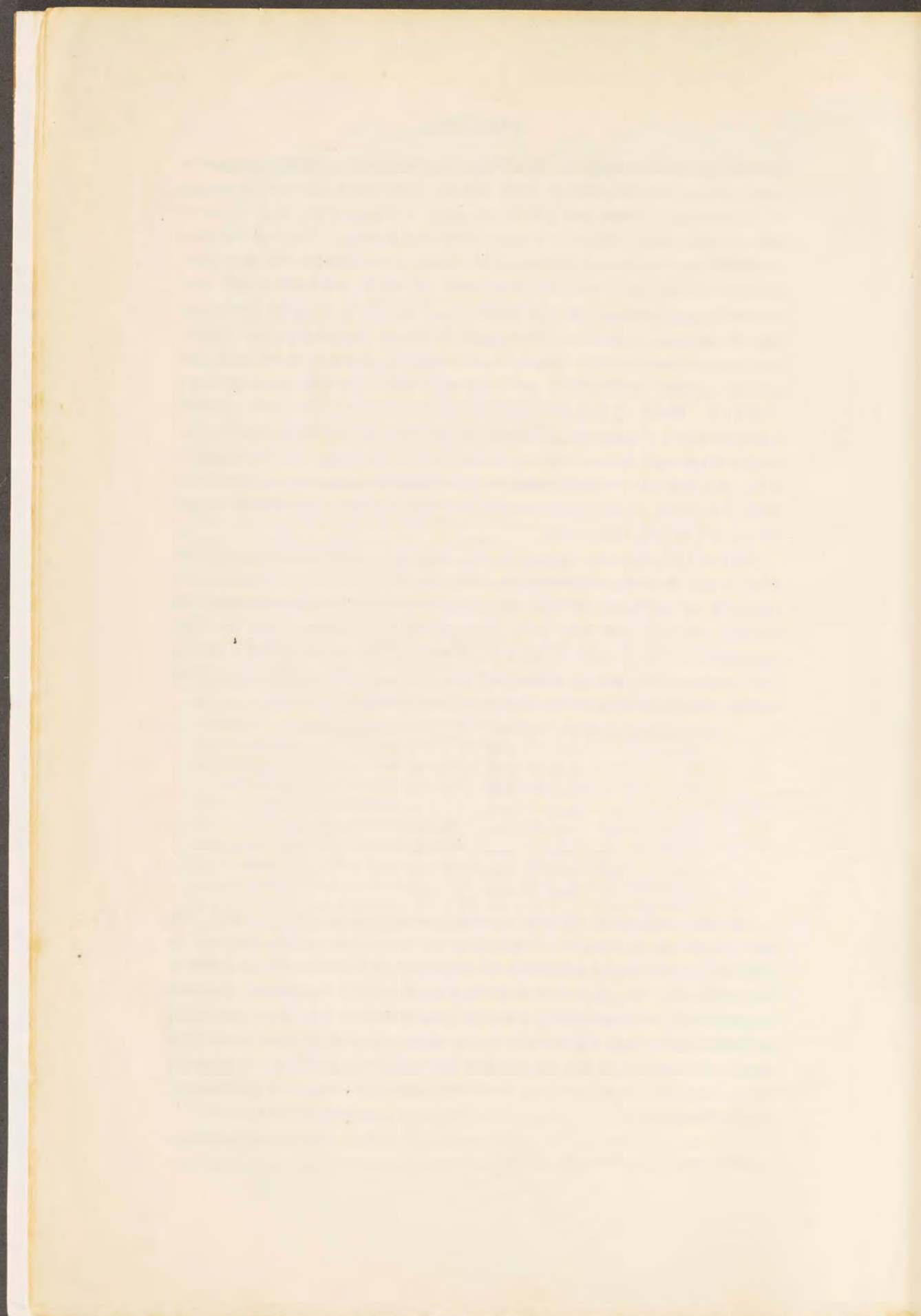
Beyond illustrating, however, the manner in which the results of such work become diffused, this list of publications is valuable historically as an index to the progress of knowledge concerning this special subject, and also as a measure of the interest and activity exhibited in the pursuit of such knowledge. The dates of the publications whose titles are given range from the year 1804 to the year 1890; during this interval they are distributed as follows:

Between the years 1801 and 1810.....				3	were published.	
"	"	1811	" 1820.....	7	"	"
"	"	1821	" 1830.....	27	"	"
"	"	1831	" 1840.....	33	"	"
"	"	1841	" 1850.....	74	"	"
"	"	1851	" 1860.....	126	"	"
"	"	1861	" 1870.....	124	"	"
"	"	1871	" 1880.....	204	"	"
"	"	1881	" 1890.....	203	"	"

At the beginning of this century, according to this record, the subject of the geology of Missouri attracted little public notice. It then received meagre attention for a period of forty years, and it was not until after the year 1840 that the importance of the subject became appreciated and that active interest was developed. From that time on this interest has apparently been vigorous and continuous. The results of the future will prove the value of this publication in nourishing this growth by guiding such interest into the most productive lines of work.

ARTHUR WINSLOW,
State Geologist.

Jefferson City, Dec. 16, 1890.



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INTRODUCTION.

The following bibliography of the geology, palæontology and mineralogy of the State of Missouri, commenced for the purpose of systematically adding to the author's library, has developed into a much larger number of titles than was at first thought to be possible, and still it is far from being complete. References to many books and papers not here included have been made, but the titles obtained have not been full enough for their insertion here.

The list of Missouri publications published since 1836 is nearly complete, almost all of the publications of the different departments of the State having been examined. Whatever may have been printed in the Journals of the first seven General Assemblies is not included, all efforts to see copies of any one of them having failed.

The transactions and journals of the scientific societies have all been examined, but, of a few, complete sets were not seen, and some papers have thus, probably, been omitted.

It will no doubt be noticed with surprise that so many Missouri fossils have been described in the publications of the Geological Surveys of other States, Illinois and Pennsylvania especially furnishing long lists. It has been the intention to give lists of all fossils for which the State of Missouri furnished the type specimens, the species being given in a note following the title of the paper in which the descriptions were contained. These lists give, in addition to the name of the species, the number of the page, plate and figure of the report in which they are described, and the geological formation and the locality in which each specimen was found. The name and formation are given as stated in the papers, and no effort is made to reduce the nomenclature to that which is at present recognized, or to correct mistakes.

For convenience of reference the titles are numbered. The first paragraph is a copy of the title, and any remarks in reference to the contents follow in a paragraph in smaller type.

In the arrangement of titles the alphabetical order has been adopted partly, and the chronological partly. The publications of the State Sur-

vey are given on the latter plan; so the Messages of the Governors of the State, and part of the other State documents. In other cases the papers from each different publication are arranged alphabetically, while the index combines all of the papers in one alphabetical list.

I am under obligations to the librarians or owners of the following libraries for access to them: Columbia College, New York City; Academy of Science, New York City; St. Louis Academy of Science; Kansas Academy of Science, Tokepa; Cornell University, Ithaca, N. Y.; Public School, including the Shumard Library, St. Louis; Kansas State Historical Society, Topeka; School of Mines, Rolla, Mo.; Missouri State, Jefferson City; Geological Survey, Jefferson City; Lieut. A. W. Vogdes, Ft. Hamilton, New York; Dr. G. Hambach and Prof. W. B. Potter, Washington University, St. Louis; Prof. J. C. Branner, State Geologist, Little Rock, Ark.; and Mr. Arthur Winslow, State Geologist of Missouri. Much other assistance was also received from the gentlemen above named and from Prof. G. C. Broadhead, formerly State Geologist of Missouri, and from Prof. H. S. Williams, Cornell University.

Where there is no statement of the size of the book or paper, it will be understood to be octavo.

No effort has been made to give complete lists of different editions, nor to show what papers in serial publications were issued in pamphlet form as Authors' editions.

The Mineral springs of the State have been included in the list because all the pamphlets describing them have analyses of the mineral waters, and a part of them have accounts of the geology of the country in which the springs are situated.

The title of each work not seen by the compiler is marked by an asterisk.

F. A. SAMPSON.

Sedalia, Mo., August 24, 1890.

BIBLIOGRAPHY.

PART I.

Publications of the State of Missouri.

PUBLICATIONS OF MISSOURI GEOLOGICAL SURVEYS.

(Chronological.)

1

SWALLOW, G. C.—The First and Second Annual Reports of the Geological Survey of Missouri, by G. C. Swallow, State Geologist. By order of the Legislature: James Lusk, Public Printer. Jefferson City, 1855. 240 pp. Plates and maps.

In Shumard's Report on Palaeontology, the following species are described: *Pentremiles Sayi*, page 185, Pl. B, Fig. 1, *a, b, c, d*, from near the base of the Encrinital in various counties.

P. Roemeri, page 186, Pl. B, Fig. 2, *a, b, c, d*, from the Chemung at Providence, Boone county.

P. curtus, page 187, Pl. B, Fig. 3, *a, b*, from the Archimedes limestone, St. Louis county.

P. elongatus, page 187, Pl. B, Fig. 4, from the Encrinital limestone, Pike county. 2
tal, Moniteau county.

Poteriocrinus Meekianus, page 188, Pl. A, Fig. 7, *a, b*, probably from the Encrinital, Moniteau county.

P. longidactylus, page 188, Pl. B, Fig. 5, *a, b, c*, St. Louis limestone, St. Louis county.

Actinocrinus concinnus, page 189, Pl. A, Fig. 5, Encrinital limestone, Marion county.

A. Missouriensis, page 190, Pl. A, Fig. 4, *a, b, c*, Encrinital limestone, Marion county.

A. rotundus, Yandell and Shumard, page 191, Pl. A, Fig. 2, *a, b*, Encrinital limestone, Marion county.

A. Christyi, page 191, Pl. A, Fig. 3, Encrinital limestone, Marion and Boone counties.

A. pyriformis, page 192, Pl. A, Fig. 6, *a, b*, Encrinital limestone, Marion county.

A. parvus, page 193, Pl. A, Fig. 9, St. Louis limestone, St. Louis.

A. Verneuilianus, page 193, Pl. A, Fig. 1, *a, b*, Encrinital limestone, Rocheport and Marion county.

A. Konincki, page 194, Pl. A, Fig. 8, *a, b, c*, Encrinital limestone, Boone and Marion counties.

- Glyptocrinus flabriatus*, page 194, Pl. A, Fig. 10, *a, b*, Cape Girardeau limestone, Cape Girardeau county.
- Tentaculites incurvus*, page 195, Pl. B, Fig. 6, *a, b*, from the same.
- Cythere sublovis*, page 195, Pl. B, Fig. 15, 1st Magnesian limestone, St. Louis and Ste. Genevieve counties.
- Proetus Swallowi*, page 196, Pl. B, Fig. 12, *a, b*, Chemung Group, Chouteau Springs, Cooper county, and in Moniteau county.
- P. Missouriensis*, page 196, Pl. B, Fig. 13, *a, b*, Lithographie limestone, Hannibal, Louisiana and Chouteau Springs.
- Cyphaspis Girardeauensis*, page 197, Pl. B, Fig. 11, *a, b*, Upper Silurian (Cape Girardeau limestone), Cape Girardeau.
- Encrinurus deltoideus*, page 198, Pl. B, Fig. 10, same as last.
- Phillipsia Merameccensis*, page 199, Pl. B, Fig. 9, Archimedes limestone, St. Louis county.
- Dalmania tridentifera* page 199, Pl. B, Fig. 8, *a, b, c*, Delthyris Shaly limestone, Perry and Cape Girardeau counties.
- Calymene rugosa*, page 200, Pl. B, Fig. 14, from the same localities.
- Acidaspis Halli*, page 200, Pl. B, Fig. 7, *a, b, c*, Cape Girardeau limestone, Cape Girardeau county.
- Productus æquicostatus*, page 201, Pl. C, Fig. 10, Upper Coal Measures, on Missouri river.
- Chonetes parva*, page 201, Coal Measures, Boone county.
- C. ornata*, page 202, Pl. C, Fig. 1, *a, b, c*, Chemung Group, Cooper and Moniteau counties, Louisiana and Hannibal.
- Spirifer plano-concava*, page 202, Upper Coal Measures, on the Missouri river.
- S. ? peculiaris*, page 202, Pl. C, Fig. 7, *a, b*, Chemung, Chouteau Springs.
- S. Kentuckyensis*, page 203, Coal Measures, Missouri river, near Weston.
- S. Marionensis*, page 203, Pl. C, Fig. 8, *a, b, c, d*, Chemung, Chouteau Springs, etc.
- yrta acutirostris*, page 204, Pl. C, Fig. 3, *a, b, c*, Lithographic Limestone at Hannibal and Louisiana.
- Rhynchonella Missouriensis*, page 204, Pl. C, Fig. 5, *a, b, c*, Chouteau Limestone, Cooper and Boone counties.
- R. Cooperensis*, page 204, Pl. C, Fig. 4, *a, b, c, d*, same as last.
- R. Booneensis*, page 205, Pl. C, Fig. 6, *a, b*, Encrinital limestone, Boone county.
- Orthis Missouriensis*, page 205, Pl. C, Fig. 9, *a, b*, Cape Girardeau limestone, Cape Girardeau.
- Leptæna mesacosta*, page 205, Pl. C, Fig. 2, from same.
- Avicula circulus*, page 206, Pl. C, Fig. 14, *a, b*, Chouteau Limestone, Cooper and Moniteau counties.
- A. Cooperensis*, page 206, Pl. C, Fig. 15, from same.
- Allorisma Hannibalensis*, page 206, Pl. C, Fig. 19, Lithographic Limestone, Hannibal.
- Pecten Missouriensis*, page 207, Pl. C, Fig. 16, St. Louis Limestone, St. Louis county.
- P. occidentalis*, page 207, Pl. C, Fig. 18, Coal Measures, Clinton county.
- Myalina sub-quadrata*, page 207, Pl. C, Fig. 17, Upper Coal Measures, Missouri river.
- Chemnitzia tenuilineata*, page 207, Pl. C, Fig. 12, Chouteau Limestone, Cooper county.
- Murchisonia melaniaformis*, page 208, Pl. C, Fig. 13, 2nd Magnesian Limestone, Franklin county.

Goniatites planorbiformis, page 208, Pl. C, Fig. 11, *a, b*, Coal Measures, Missouri river.

Filicites gracilis, page 208, Pl. A, Fig. 11, Lithographic limestone, Pike and Marion counties.

2

SWALLOW, G. C.—Third Report of Progress of the Geological Survey of Missouri, by G. C. Swallow. [Dec. 1856. For 1855-6.] 3 pp. <Appendix to the Journals 1st Session, Nineteenth General Assembly 1856. Jefferson City, 1857, pp. 245-247.

3

SWALLOW, G. C.—[Fourth] Report of Progress. Geological Survey. By G. C. Swallow. [Dec. 22, 1858. For 1857-8.] <Appendix to Journals, 1st Session, Twentieth General Assembly, 1858. Jefferson City, 1859; pp. 97-106.

4

SWALLOW, G. C.—[Fifth] Report of Progress. Geological Survey. By G. C. Swallow. [Dec. 30, 1860. For 1859-60]. <Appendix to the Journals, 1st Session, Twenty-first General Assembly, 1860. Jefferson City, 1861; pp. 521-533.

5

SWALLOW, G. C. Geological Report of the Country along the Line of the South-western Branch of the Pacific Railroad, State of Missouri. By G. C. Swallow, State Geologist. To which is prefixed a Memoir of the Pacific railroad. St. Louis: Printed by George Knapp & Co., 1859. 93 pp., plates and Geological map of South-west Missouri.

A somewhat fuller report was made by Prof. Swallow, and was published by the Pacific Railroad Company in New York.*

6

HAGAR, A. D.—Annual Report of the State Geologist of the State of Missouri. [Albert D. Hagar. Nov. 30, 1870.] 23 pp. <Appendix, Regular Session, Twenty-sixth General Assembly, 1871; pp. 21-43.

7

BROADHEAD ET AL. Report on the Geological Survey of the State of Missouri; 1855-1871. By G. C. Broadhead, F. B. Meek and B. F. Shumard. Published by authority of the Legislature, under the direction of the Bureau of Geology and Mines. Jefferson City, 1873; pp. 324 and iv.

8

PUMPELLE, R.—Geological Survey of Missouri. Raphael Pumpelly, Director. Preliminary Report on the Iron Ores and Coal Fields from the Field Work of 1872, with 190 Illustrations in the Text and an Atlas. Printed by authority of the Legislature of Missouri, under the direction of the Bureau of Geology and Mines. New York, 1873; pp. xvi. 214, 441. Atlas Accompanying Reports of Missouri Geological Survey, 1874. Jefferson City, 1874.

9

BROADHEAD, G. C.—Report of the Geological Survey of the State of Missouri, including Field work of 1873-1874, with 91 illustrations and an atlas. Garland C. Broadhead, State Geologist. Printed by the authority and under the direction of the Bureau of Geology and Mines. Jefferson City, 1874; pp. 734, L, 4, 56.

10

WILLIAMS, C. P.—Geological Survey of Missouri. Industrial report on lead, zinc and iron, together with notes on Shannon county and its copper deposits. By Charles P. Williams, Ph. D., Acting State Geologist. Jefferson City, 1877; pp. 177 and xvi.

11

WILLIAMS, C. P.—Report to the Board of Curators concerning the transfer of the Geological Survey to the School of Mines, and the work executed during the year. By Charles P. Williams, Ph. D., Director Missouri School of Mines and Acting State Geologist. 4 pp. <Missouri State University report for 1876, pp. 213-216.

12

WINSLOW, A.—Geological Survey of Missouri. Arthur Winslow, State geologist. Bulletin No. 1. Contents: Administrative report. By Arthur Winslow, State geologist, page 1. The coal beds of Lafayette county. By Arthur Winslow, State geologist, page 14. The building stones and clays of Iron, St. Francois and Madison counties. By G. E. Ladd, assistant geologist, page 22. The mineral waters of Saline county. By A. E. Woodward, assistant geologist, page 45. A preliminary catalogue of the fossils occurring in Missouri. By G. Hambach, palaeontologist, page 60. Published by the Geological Survey. Jefferson City. April, 1890; pp. 85.

13

WINSLOW, A.—Geological Survey of Missouri. Arthur Winslow, State geologist. Bulletin No. 2. A Bibliography of the Geology of Missouri. By F. A. Sampson. Published by the Geological Survey, Jefferson City, August, 1890; pp. —.

GOVERNORS' INAUGURAL ADDRESSES.

(Chronological.)

14

STEWART, R. M.—Inaugural Address of Governor R. M. Stewart. 8 pp. <House Journal, Adjourned Session, 19th General Assembly, 1857. Jefferson City, 1857; pp. 23-30. <Senate Journal, same, pp. 18-25. The mineral resources of the State are noticed.

15

JACKSON, C. F.—Inaugural Address of Gov. C. F. Jackson, Jan. 3, 1861. 8 pp. <Senate Journal, 1st Session, 21st General Assembly, 1860. Jefferson City, 1861; pp. 46-54. <House Journal, same, pp. 45-53.

The Governor refers to the work of the Geological Survey, with favorable mention.

16

PHELPS, J. S.—Inaugural Address of Gov. John S. Phelps. 8 pp. <Senate Journal, Regular Session, 29th General Assembly, 1877. Jefferson City, 1877; pp. —. <House Journal, same, pp. 52-59.

He notices the mineral resources and encourages their development.

GOVERNORS' MESSAGES.

(Chronological).

17

BOGGS, L. W.—Message of Governor Lilburn W. Boggs, 16 pp. <Senate Journal, 1st Session, 10th General Assembly, 1838. City of Jefferson, 1839; pp. 13–28.

An appropriation is recommended for establishing a Geological Survey, and for the appointment of a competent and scientific man to direct it. He also gives an account of the survey of the line between Missouri and Iowa.

18

BOGGS, L. W.—Message of Gov. Lilburn W. Boggs, Nov. 17, 1840. 15 pp. <Senate Journal, 1st Session, 11th General Assembly, 1840, pp. 15–29. House Journal, same, pp. 12–26.

Notifies the surveys of the Meramec, Salt, Osage and North Grand rivers; also the geological examination of the Osage river, the latter showing coal, lead and iron.

19

EDWARDS, J. C.—Message of Gov. John C. Edwards, Nov. 16, 1846. <Senate Journal, 1st Session, 14th General Assembly, 1846. Jefferson City, 1847; pp. 25–35. <House Journal, same, pp. 17–28.

The subject of establishing a Geological Survey of the State is recommended to the attention of the Legislature.

20

KING, A. A.—Message of Gov. Austin A. King, Dec. 30, 1850. <Senate Journal, 1st Session, 16th General Assembly, 1850. Jefferson City, 1851; pp. 20–46. <House Journal, same, pp. 30–56.

He favors a geological survey, to be made in a thorough manner and on a liberal scale, but thinks that the General Government should contribute to its accomplishment, and recommends that the memorial of the last Legislature be again pressed upon the attention of Congress. He also strongly recommends the establishment of a School of Mines.

21

PRICE, S.—Message of Gov. Sterling Price, Dec. 25, 1854. 13 pp. <Senate Journal, 1st Session, 18th General Assembly, 1854. Jefferson City, 1855; pp. 14–26. <House Journal, same, pp. 21–32.

This recounts what had been done under the law of the preceding session establishing a Geological Survey, and recommends a further appropriation.

22

PRICE, S.—Message of Gov. Sterling Price, Dec. 29, 1856. <Senate Journal, 1st Session, 19th General Assembly, 1856. Jefferson City, 1857; pp. 14-23. <House Journal, same, same pages.

He states that the results of the work of the survey, as shown by its published reports, must convince every one that the State is most amply compensated for the outlay.

23

STEWART, R. M.—Message of Gov. R. M. Stewart, Dec. 29, 1858. <Senate Journal, 1st Session, 20th General Assembly, 1858. Jefferson City, 1859; pp. 14-37. <House Journal, same, same pages.

The work of the survey is reviewed, and the statement made that the increased sales of lands by means of the publications of the State Geologist had added revenue more than the cost of the survey.

24

STEWART, R. M.—Message of Gov. R. M. Stewart, Jan. 3, 1861. 25 pp. <Senate Journal, 1st Session, 21st General Assembly, 1860. Jefferson City, 1861; pp. 20-44. <House Journal, same, pp. 18-43.

The work of the Geological Survey is reviewed and its continuance recommended.

25

FLETCHER, T. C.—Message of Gov. Thos. C. Fletcher, Jan. 8, 1869. Senate Journal, 1st Session, 25th General Assembly, 1869. Jefferson City, 1869; pp. 13-35. <House Journal, same, pp. 21-44.

He recommends an appropriation sufficient to allow the Board of Immigration to procure from the published and unpublished portions of the Geological Survey of the State, and other reliable sources, the compilation and publication of a concise and practical report on the Geology of the State.

26

MCCLURG, J. W.—Message of Gov. Joseph W. McClurg, Jan. 5, 1870. <Journal, Senate, Adjourned Session, 25th General Assembly, 1870. Jefferson City, 1870, pp. 7-26. <House, same, same pages.

He considers the resources of the State, and the ways of making them known to the people. He declares that there is no question as to the value of Swallow's geological reports.

27

MCCLURG, J. W.—Message of Gov. Joseph W. McClurg to the 26th General Assembly of Missouri. Jefferson City, 1871; pp. 19. Appendix 26th General Assembly, 1871, Regular Session. Senate Journal, same, pp. 14-26.

The Governor expresses the opinion that the Legislature will be gratified with the work of the Geological Survey, and he gives an account of the work of State Geologist Hagar on pp. 14-15, or pp. 22-23 of the Senate Journal.

28

BROWN, B. G.—Message of Governor B. Gratz Brown, made January 26, 1871. 4 pp. <Senate Journal, Regular Session, 26th General Assembly, 1871. Jefferson City, 1871; pp. 124-127. <House Journal, same, pp. 123-127.

Advises the reduction of the number of the Board of Managers of the Mining, Metallurgical and Geological Bureau, so as to make it more efficient.

29

BROWN, B. G.—Message of Governor B. Gratz Brown to the Adjourned Session of the 26th General Assembly of the State of Missouri, December 6, 1871. Jefferson City, 1871. <Appendix Adjourned Session 26th General Assembly, Jefferson City, 1871. <Senate Journal, same, pp. 6-31. <House Journal, same, pp. —.

This notices the mineral development of the State and the work of the Geological Survey.

30

CRITTENDEN, T. T.—Message of Governor Thos. T. Crittenden, Jan. 7, 1885. <Senate Journal, Regular Session, 33d General Assembly, 1885. Jefferson City, 1885, pp. 12-71. <House Journal, same, pp. 17-76.

Announces that he had appointed James F. Brooks to take charge of the topographical survey of the sunk and overflowed lands of Southeast Missouri, which had been provided for by a previous Legislature, and that the engineer had expended the appropriation, but made no report.

31

MOREHOUSE, A. P.—Message of Governor Albert P. Morehouse, Jan. 9, 1889. <Appendix to Senate and House Journals. Regular Session, 35th General Assembly, 1889, pp. 1-26.

He approves of the law establishing a State Mine Inspector, and urges a larger appropriation, so that the Mine Inspector can be kept in the field and keep pace with the rapidly increasing mining interests of the State.

REPORTS OF LEGISLATIVE COMMITTEES.

(Chronological.)

MISCELLANEOUS COMMITTEES.

32

IRON MOUNTAIN.—Report by Mr. Monroe of the Select Committee to consider the subject of the Iron mountain. 2 pp. <Senate Journal, 1st Session, 10th General Assembly, 1838. City of Jefferson, 1839; pp. 208-209.

The committee reports in favor of the State helping to build a railroad from Iron mountain to Iron Mountain City, on account of the benefit to the people from the development of the iron mines belonging to the Missouri Iron Mountain company.

33

AMERICAN IRON MOUNTAIN COMPANY.—Report of the Select Committee respecting the incorporation of the American Iron Mountain company. <House Journal, Appendix, 1st Session, 12th General Assembly, 1842. Jefferson City, 1843; pp. 640-643.

34

PUBLIC SALINES.—Report of Committee on Public Salines, 1 page. <House Journal, Appendix, 1st Session, 13th General Assembly, 1844. City of Jefferson, 1845; p. 229.

The committee reports that the total quantity of land selected by the State for saline purposes was 47,258.65, of which there had been sold 32,075.88 acres.

35

INTERNAL IMPROVEMENT.—Report of the Committee on Internal Improvements, in favor of a Geological Survey of the State. (Signed by) Dewitt C. Ballou, of Benton, Chairman. 8 pp. <House Journal, Appendix, 1st Session, 14th General Assembly, 1846. Jefferson City, 1847; pp. 250-257.

This report is strongly in favor of establishing a Survey, and the committee presented a bill for that purpose.

36

MANUFACTURES AND CORPORATIONS.—Report of the Select Committee on Manufactures and Corporations. 8 pp. <Senate Journal, Appendix, 1st Session, 15th General Assembly, 1848. Jefferson City, 1848; pp. 188–195.

The committee directs attention to the vast mineral resources of the State offering inducements to manufacturers of every article of iron, steel, copper and lead; and also to the “china clay, feldspar, siliceous, mica, magnesia and cobalt.”

37

INTERNAL IMPROVEMENT.—Report of Committee on Internal Improvements in regard to Swamp lands; p. 232. Report of Committee on Internal Improvements on the bill granting the right of way for the Mississippi & Pacific Railroad; p. 246. <Senate Journal, Appendix, 1st Session, 15th General Assembly, 1848.

The first refers to the memorial of the Bloomfield convention in 1847, and the second recites the advantages the road would be to the utilization of “the vast mines of iron ore and inexhaustible deposits of coal that abound in Missouri.”

38

PRINTING GEOLOGICAL REPORT.—Report of Committee on Printing Prof. Swallow’s Report on Geological Survey; 1 page. <House Journal, Appendix, 1st Session, 18th General Assembly, 1854. Jefferson City, 1855; p. 393.

39

GEOLOGICAL SURVEY.—Report of the Joint Committee on the Geological Survey. January 15, 1859; 1 page. <Appendix to the Journals, 1st Session, 20th General Assembly. Jefferson City, 1859; p. 408.

The Committee reports unanimously in favor of continuing the survey.

40

GEOLOGICAL SURVEY.—Account of expenditures of Bureau of Mines, etc. <Appendix to Journals, Regular Session, 26th General Assembly, 1871; p. 128 of documents accompanying Governor’s message.

This account is from Oct. 1, 1870, to Dec. 1, 1870, under Hagar.

REPORTS OF THE COMMITTEES ON MINES, ETC.

41

1873.—Report on the Mines, Manufactures and other Interests of the State of Missouri, by the House Committee, 27th General Assembly, Regular Session, Jefferson City, 1873. March 10, 1873, 67 pp. German edition, 102 pp. <Journal of the House of Representatives, Regular Session, 28th General Assembly; pp. 1397–1461.

42

1874.—Report on the Mines, Manufactures and other Interests of the State of Missouri, by the House Committee on Manufactures; 27th General Assembly, Adjourned Session. Jefferson City, 1874. March 26, 1874. 115 pp. German edition, 120 pp.

43

1875.—Report of Committee on Mines and Mining. Feb. 16, 1875. 5 pp. <Journal House, Regular Session, 28th General Assembly, 1875. Jefferson City, 1875; pp. 621-625.

This is a report on the School of Mines at Rolla.

44

1879.—Report of Committee on Mining and Manufacturing. April 2, 1879. 3 pp. <Appendix Senate and House Journals of 1879. Part 22. Jefferson City, 1879.

This is also a report on the School of Mines.

45

1881.—Report of Committee on Mining and Manufactures to the 31st General Assembly of Missouri, March 18, 1881. 21 pp. <Appendix Senate and House Journals, Regular Session, 31st General Assembly, 1881. Jefferson City, 1881.

MEMORIALS TO THE LEGISLATURE.

(*Chronological*) -

46

INTERNAL IMPROVEMENT CONVENTION.—A Memorial to the General Assembly from the Committee appointed for that purpose, by the Internal Improvement Convention, held at Springfield, Mo., in Oct., 1846. (Signed by) F. P. Wright, James M. Major and James Winston. 5 pp. <Appendix House Journal, 1st session, 14th General Assembly, 1846. Jefferson City, 1847; pp. 245-249.

This urges an appropriation for improving the Osage river, and recites the results of a scientific survey of the river by Mr. Morell, engineer, in 1840, and the benefits to be obtained from the mineral and other resources of the part of the State traversed by the river.

47

HISTORICAL AND PHILOSOPHICAL SOCIETY.—Memorial on the subject of a Geological Survey of the State, to the General Assembly of Missouri. (Signed by) Falkland H. Martin, Sol. D. Caruthers, S. T. Glover, W. G. Minor and DeWitt C. Ballou, a Committee of the Historical and Philosophical Society of Missouri. 13 pp. <Appendix House Journal, 1st Session, 15th General Assembly, 1848. Jefferson City, 1849; pp. 175-187.

The Society urges the Legislature to order a geological survey of the State, and among the special reasons for doing so is the reclamation of the country affected by the New Madrid earthquake of 1811, concerning which they say: "The effects of which are still to be seen in yawning chasms, where the solid earth was rent in twain, and in the vast lakes and marshes which cover the sunken surface of the land in many places through a region of country extending several hundred miles."

48

CITIZENS OF CAPE GIRARDEAU.—Memorial from the citizens of Cape Girardeau in reference to a railroad. (Signed by) Albert Jackson and nine others. 4 pp. <Senate Journal, Appendix 1st Session, 15th General Assembly, 1848. Jefferson City, 1848; pp. 203-206. House Journal, Appendix, same, pp. 208-211.

The Legislature was then considering a railroad route from Lexington to some point on the Mississippi. This report shows that Cape Girardeau was the only eligible terminus; that New Madrid was not a proper point because the banks of the river at that place were constantly caving in; that Ohio City, opposite the mouth of the Ohio river, could not be reached, it being thirty miles from the highlands, this distance being traversed by lakes and swamps, and these, with annual overflow from the rivers, precluding the building of a road on this route; Commerce was the first point from the mouth of the Mississippi river having a rock-bound shore. To reach it, however, the great swamp would have to be crossed at a point two miles from Cape Girardeau. The swamp here is at its narrowest, and is about three miles wide, presenting indications that this swamp was formerly the bed of the Mississippi river. When the river rises to a considerable height a part of its water flows through the swamp, covering it from bank to bank from three to fifteen feet. The advantages of Cape Girardeau by reason of its proximity to the mineral region of Washington, St. Francois and Madison counties are also noticed.

49

PACIFIC RAILROAD.—Memorial of the President and Directors of the Pacific railroad to the General Assembly of the State of Missouri. <Senate Journal, Appendix, Regular Session, 17th General Assembly, 1852. Jefferson City, 1852; pp. 3-24.

In addition to the memorial there is a report by the Chief Engineer, Thos. S. O'Sullivan, with estimates and grades of the different proposed routes.

50

STATE AGRICULTURAL SOCIETY.—Memorial of the State Agricultural Society to the General Assembly. 3 pp. <Appendix to the Journals 1st Session 18th General Assembly, 1854. Jefferson City, 1855; pp. 310-312.

The society asks that the State Geologist be directed to give special attention to the agricultural interests of the State, examine soils and fertilizers, etc.

51

SWALLOW, G. C.—Letter from Prof. Swallow to the Secretary of State, Nov. 30, 1855. 2 pp. <House Journal, Appendix, Adjourned Session, 18th General Assembly, 1855. Jefferson City, 1856; pp. 301-2.

This accompanies the transmission of a part of the First and Second Annual reports.

52

REED, SILAS.—Memorial to Congress on the subject of the Development of the Mineral Resources of Missouri. (Signed by) Silas Reed, Stanton Copper Mines, Franklin county, Missouri, Feb. 13th, 1857; pp. 8. <Appendix Senate Journal, 1st Session, 19th General Assembly, 1856. Jefferson City, 1857; pp. 345-352.

This states that the writer, on his own account, and in behalf of his associates, and the Stanton Copper Mining company, entered land in 1845 which he believed contained a valuable copper vein, and in 1848 he had explorations made. He found a very rich vein and erected copper smelting works; but on account of want of skill the first and second years were failures. The third year was more satisfactory, and in 1851 they erected a fourth furnace. They extended their shafts and drifts, and from 1853 to 1855 employed steam power. The vein under the engine house at its deepest level yielded ore of 60 per cent pure copper. In the north hill, where the main body was found, the vein changed to mundic, which was too poor in copper to pay for working, and the company suspended mining operations in 1855. The geological formation of the different mines in Missouri is described, and Congress is urged to donate one or more townships to Missouri for the purpose of sinking deep shafts, and thoroughly testing the extent of the minerals, the profits to be devoted by the State to the founding of a School of Miners.

53

MCKENZIE, JAMES.—Petition to the Honorable, the Senate, etc., of James McKenzie, of St. Louis. 2 pp. <Senate Journal, Appendix, Adjourned Session, 22d General Assembly, 1863. Jefferson City, 1863; pp. 31-32.

This called the attention of the Legislature to the need of foreign capital to develop the mineral resources of the State.

Also report of Senator Muench, Chairman of the Select Committee to which the memorial was referred. <Senate Journal, same, pp. 69-71.

54

MEMORIAL.—A memorial to the President and Congress of the United States and to the Secretary of War, asking for a Fort or Garrison, to be established near the southwestern corner of the State. 3 pp. Appendix Senate Journal, Regular Session, 23d General Assembly. Jefferson City, 1865; pp. 600-602.

The reasons for the establishment of the garrison by the Government were the disturbed condition of the country, the existence of "the finest and largest salt springs in America," and the mineral resources of Southwest Missouri. The different mines and furnaces were noticed

55

KANSAS LEGISLATURE.—Resolutions adopted by the Kansas Legislature relative to Geological Survey. 1 page. <Senate Journal, Appendix, Adjourned Session, 23rd General Assembly, 1865-6. Jefferson City, 1866; page 570.

This was a request for a permit for the State Geologist of Kansas to use in his report to that State the information gained by him while Geologist of Missouri.

56

ST. LOUIS ACADEMY OF SCIENCE.—Memorial of the Academy of Science of St. Louis, to the Legislature, Jan. 21, 1867. (Signed by) Nathaniel Holmes, Benjamin Shumard, Enno Sander, committee. 1 p. <Appendix House Journal, 24th General Assembly, page 125. Jefferson City, 1867.

The memorial asks that the work of the Geological Survey be completed and the results published.

57

ST. LOUIS ACADEMY OF SCIENCE.—Resolutions passed by the Academy of Science of St. Louis. Geological Survey. 1 page. <Appendix House Journal, 24th General Assembly. Jefferson City, 1867; page 571.

This was a protest against the transfer of the matter appertaining to the State Survey to the hands of any one except the late State Geologist.

REPORTS OF STATE BOARDS.

(Chronological)

REPORTS OF BOARDS OF INTERNAL IMPROVEMENTS & OF PUBLIC WORKS.

58

INTERNAL IMPROVEMENTS.—Journal of the Proceedings of the Board of Internal Improvements. Report of the Board of Internal Improvements to the General Assembly of Missouri, pp. 485-525.

Report of Chief Engineer Morell, pp. 484-525.

Report of a Geological Reconnoissance of that part of the State of Missouri adjacent to the Osage River, made to William H. Morell, Chief Engineer of the State, by order of the Board of Internal Improvement, by Henry King, M. D., Geologist, President of the Western Academy of Natural Sciences, etc., etc.; pp. 506-525. <Senate Journal, Appendix, 1st Session, 11th General Assembly, 1840; pp. 458-525.

The Journal gives the proceedings of the meetings from May 6, 1839, to Dec. 29, 1840, showing the appointment of William H. Morell as Chief Engineer of the State, of Commissioners for the Surveys of the North Grand, Salt, Osage and Meramec rivers and the railroad route from St. Louis to the Iron Mountain, and the appointment of Dr. H. King as Geologist of the Osage river survey.

59

LEVEE COMMISSIONERS.—Report of the State Commissioners of their survey of the levee and canal in New Madrid county, to the General Assembly of Missouri, Sept. 23, 1848. (Signed by) Godfrey Lesieur, Thos. C. Powell, James Eastwood, John Hamlin and S. G. Kitchen. 7 pp. <Senate Journal, Appendix, 1st Session, 15th General Assembly, 1848, Jefferson City, 1848; pp. 197-203; <House Journal, Appendix, same, pp. 202-207.

The condition of the streams, swamps and morasses in Southeast Missouri at that time is described. The Commissioners found an "ocean of water" from the junction of Castor with Little river, about eight miles wide and extending towards Bloomfield, twenty or thirty miles, and averaging two and one-half feet deep, and this was so matted with "wild corn" that after trying for three days to work their way through in canoes they decided that it was impossible. Their survey was in the part of the State where the earthquake of 1811 was so disastrous.

60

RAILROAD.—Report of the Cairo & Fulton Railroad Co. Communication to the Governor, Jan. 23, 1855; pp. 10. <Appendix to the Journals, 1st Session, 18th General Assembly, 1854. Jefferson City, 1855; pp. 289-298.

The report of James S. Williams, Chief Engineer, has a detailed and interesting account of the topography of the Missouri section of the road.

61

BOARD OF PUBLIC WORKS—Pacific Railroad.—Report of the Board of Public Works made to the Governor of the State of Missouri, Dec. 1855. <Senate Journal, Appendix, Adjourned Session, 18th General Assembly, 1855. Jefferson City, 1855; pp. 159-221. <House Journal, Appendix, same, same pages.

The report of Thomas S. O'Sullivan, engineer and superintendent, on the surveys of the Pacific railroads, is on pages 165-170.

62

IRON MOUNTAIN RAILROAD.—Statement of the condition of the affairs of the St. Louis & Iron Mountain Railroad Company, Feb. 1, 1856. <Appendix, House Journal, 1st Session, 19th General Assembly, 1856. Jefferson City, 1857; pp. 415-422.

This has reports by Madison Miller, president, and J. B. Moulton, chief engineer.

REPORTS OF THE BOARD OF IMMIGRATION.

(Chronological.)

63

WATERHOUSE, S.—The Resources of Missouri, by S. Waterhouse, St. Louis. Edition, 20,000 copies. St. Louis, Mo., 1867. 64 pp.

This was also issued as part of a State publication entitled "Reports Board of Immigration and Commissioner of Statistics, Missouri, 1867," and was prepared at the request of the State Board of Immigration.

64

WATERHOUSE, S.—The Resources of Missouri and the Natural Adaptation of St. Louis to Iron Manufactures. By Sylvester Waterhouse, St. Louis. Second enlarged edition. St. Louis, 1869. 64 and 31 pp.

65

BOARD OF IMMIGRATION.—Missouri, its Progress and Resources, being a part of the Third Biennial report of the Board of Immigration. 11 pp. <Third Biennial Report of the Board of Immigration, Jefferson City, 1871. <Appendix 26th General Assembly, Regular Session, 1871.

66

O'NEILL, J. J.—Resources of the State of Missouri, by Hon. John J. O'Neill, Chairman of the House Committee on Immigration. 29th General Assembly. Published for gratuitous distribution by order of the House. Jefferson City; Regan & Carter, State Printers and Binders, 1877; pp. xxv, 149, v.

67

BOARD OF IMMIGRATION.—The Agricultural, Manufacturing, Commercial and Geographical Center of the Mississippi Valley, Missouri, the Imperial State, its Wealth and Resources. 1880. 72 pp.

<First Biennial report of the State Board of Immigration, January, 1881. Jefferson City, 1881; pp. 21-92.

This part of the report was also issued as a separate pamphlet of 48 pages.

REPORT OF COMMISSIONER OF STATISTICS.

68

SWALLOW, G. C.—Physical Geography of Missouri. From unpublished notes of the Geological Survey. By G. C. Swallow. 29 pp. First Annual Report of the Commissioner of Statistics to the General Assembly of the State of Missouri, for the year 1866; pp. 97-125.

This report was also published as a part of Appendix, House Journal, 24th General Assembly, 1867. Jefferson City, 1867; pp. 719-747. It was also published as part of a volume entitled "Report Board of Immigration and Commissioner of Statistics, Missouri, 1867." See also Agricultural Reports of Missouri.

REPORTS OF THE BUREAU OF LABOR STATISTICS.

(Chronological.)

69

HILKENE, W. H.—Mining. <First Annual Report of the Labor Bureau for 1879. [W. H. Hilken, Commissioner.] Jefferson City, 1880; pp. 89-94.

70

HILKENE, W. H.—Wages and Modes of Payment.—Mining. Coal, Lead, and Iron. <Second Annual Report for 1880. Jefferson City, 1881.

In the first article the modes of payment by different coal, lead and iron companies in the State are given on pages 24-38. The second article has much of interest in regard to the methods of operating the various mines of the State; pp. 89-127.

71

SPAUNHORST, H. J.—Mine Inspectors' Reports. <Fourth Annual Report Labor Bureau, for 1882. Henry J. Spaunhorst, Commissioner. Jefferson City, 1883; pp. 147-152. <German edition, pp. 151-157.

72

NEWMAN, H. A.—Mine Inspector's Reports for the year 1882. Tabulated Statement Mine Inspector's Reports. <Fifth Annual Report for 1883. Jefferson City, 1884. H. A. Newman, Commissioner; pp. 81-127.

The second title includes reports for 1883, the first having those which were omitted from the report of the previous year.

73

NEWMAN, H. A.—Mine Inspector's Report for the year 1884. <Sixth Annual Report for 1884. H. A. Newman, Commissioner; pp. 269-299.

74

KOCHTITZKY, OSCAR.—Seventh Annual Report of the Bureau of Labor Statistics of the State of Missouri, for the year ending Dec. 31, 1885. Jefferson City, 1886. Oscar Kochtitzky, Commissioner.

This has the following: Coal Miners' Strike at Bevier, pp. 14-18. Coal Mine Inspectors' Reports [for 1885], pp. 117-155. Lead Mines, Lead and Zinc Mining, pp. 157-160. Missouri Labor Laws. Mining Laws. Weighing of Coal. Inspection of Mines, pp. 209-228.

75

KOCHTITZKY, OSCAR.—Eighth Annual Report of the Bureau of Labor Statistics, 1886.

This contains Mines and Mining (Mine Inspectors' Reports for 1886), pp. 29-87.

76

KOCHTITZKY, OSCAR.—State Mine Inspector. <Ninth Annual Report for 1887. Jefferson City, Mo., 1888; pp. 16-22.

This has the act of the Legislature of March 30, 1887, for the appointment of a State Mine Inspector instead of County Mine Inspectors, and of the action of the Bureau in the matter.

77

WOLFE, M. L.—First Annual Report of the State Mine Inspector. M. L. Wolfe, State Mine Inspector. 82 pp. <Ninth Annual Report for 1887, pp. 177-258.

78

KOCHTITZKY, OSCAR.—Special report to the Governor of an investigation by the Commissioner of Labor Statistics and Inspection (including State Mine Inspector's Report and Papers by Mining Experts), of the coal mine explosion at Rich Hill, Mo., March 29, 1888. St. Louis, Mo., 1888; p. 63, v, folded diagram. Also Tenth Annual Report Labor Bureau.

79

POTTER, W. B.—Report of William B. Potter, Mining Engineer. 20 pp. and folded plan. <Special report of Commissioner of Labor Statistics and Inspection on Coal Mine Explosion at Rich Hill, Mo. March 29, 1888. St. Louis, Mo., 1888; pp. 38-57. <Tenth Annual Report of the Labor Bureau. Jefferson City, 1889.

80

WOLFE, M. L.—Report of the State Mine Inspector for 1888. <Tenth Annual Report Labor Bureau, Jefferson City, 1889; pp. 59-125.

81

WOLFE, M. L.—Report of Hon. M. L. Wolfe, State Mine Inspector. 30 pp. Special report, etc., Coal Mine Explosion at Rich Hill, Mo., March 29, 1888. St. Louis, Mo., 1888; pp. 8-37. <Tenth Annual Report of the Labor Bureau. Jefferson City, 1889.

82

MERIWETHER, LEE.—Eleventh Annual Report of the Bureau of Labor Statistics, 1889. Lee Meriwether, Commissioner; pp. 517, v.

This report is taken up nearly altogether with mining matters.

83

WOODSON, C. C.—Report of the State Mine Inspector for the year 1889. <Eleventh Report, Labor Bureau, pp. 447-517.

ANNUAL REPORTS OF THE STATE UNIVERSITY.

(Alphabetical)

84

BROADHEAD, G. C.—The Relation of the Soils of Missouri to Geology. (Lecture delivered in the University Chapel, March 29, 1884.) By G. C. Broadhead of Pleasant Hill, Mo., former State Geologist. 8. pp. <Report of 1883-4, pp. 72-79.

85

COMMITTEE REPORT.—Report of the Committee on the location of the School of Mines. <Report of 1871, pp. 16-22.

This report describes the minerals found in Phelps county, the committee reporting in favor of locating the school in that county.

86

READ, DANIEL.—Address delivered upon the occasion of the formal opening of the School of Mines at Rolla, on the 23d of November, 1871. By Daniel Read, LL.D., President of the University. 12 pp. <Report of 1872, pp. 121-132.

87

ROLLINS, J. S.—Report of the Board of Curators of the State University. <Report of 1876, pp. 9-10.

Maj. J. S. Rollins, as President of the Board of Curators, recommends that the Board be created a Board of Geological and Agricultural Survey, and of Agricultural and Economic Statistics.

88

SCHWEITZER, P.—Contributions from the Laboratory of the State University. Columbia Chalybeate Spring. The Water Supply of the

Town of Columbia, Boone County, etc., etc., by P. Schweitzer, Ph. D., Professor of Analytical and Applied Chemistry. 10 pp. <Report of 1874, pp. 160-169.

89

SCHWEITZER, P.—Contributions from the Laboratory of the State University. <Report of 1875, pp. 155-193.

This contains reports "On the true Composition of Coal, and on the methods of arriving at it, with deductions and remarks on Coal in general, illustrated on a sample of coal from the Lower Coal series of Missouri," and on "The water supply of Columbia, Boone county, Missouri; being an exposition of the origin of the springs and subterranean Water-courses of the town and neighborhood, with some analyses of cistern water."

90

SCHWEITZER, P.—Contributions, etc. The Various Methods of Separating and determining Baryum, Strontium and Calcium. Part 1. Determination of Baryum. 36 pp. <Report of 1876, pp. 161-196.

91

SWALLOW, G. C.—Report of Prof. Swallow, on the Agricultural and Mechanical College. By G. C. Swallow, Professor of Agriculture. 26 pp. <Report of 1871, pp. 81-105.

The report contains descriptions and analyses of the soils of Missouri on pages 94-105.

92

WILLIAMS, C. P.—Contributions to a Knowledge of the Iron Ores of Missouri. By Prof. Chas. P. Williams, Director of the School of Mines. 15 pp. <Report of 1872, pp. 133-147.

The report contains analyses of many Missouri iron ores.

93

WILLIAMS, C. P.—The Missouri Zinc Ores and their Products, with some Miscellaneous Analyses. 11 pp. <Report of 1874, pp. 149-159.

94

WILLIAMS, C. P.—Contributions from the Laboratory of the School of Mines. <Report of 1875, pp. 195-208.

The subjects treated are: "Commercial Leads of Missouri," "Zinc Oxide, or White, Manufactured in Missouri," and "Chemical Study of the Ozark Blast Furnace."

95

WILLIAMS, C. P.—Contributions from the Laboratory of the Missouri School of Mines and Metallurgy. (University of Missouri.) No. IV. 16 pp. <Report of 1876, pp. 197–212.

This contains the following titles: Composition of Missouri Leads; Copper Ores of Shannon County; Some Mineral Species associated with Hematite Ore at Buckland's bank, Phelps county; Metallurgical Products from Mine LaMotte; Smithsonite from Dade county; Sweet Springs water, Saline county; Oxide of Zinc prepared from Missouri ores.

96

WILLIAMS, C. P.—Report to the Board of Curators concerning the Transfer of the Geological Survey to the School of Mines, and the work executed during the year. 4 pp. <Report of 1876, pp. 213–216.

REPORTS OF THE BOARD OF AGRICULTURE.¹

(Alphabetical.)

97

ANONYMOUS.—Report of a reconnoissance along the line of the Western Branch of the North Missouri railroad, from Moberly to Leavenworth. 8 pp. <First Report, 1865, pp. 174–181. <Appendix Senate Journal, Adjourned Session, 23d General Assembly. Jefferson City, 1865–6; pp. 174–181.

98

BLOW, H. T.—The Iron State. Mines and Mining in Missouri. Address of Hon. H. T. Blow before the School of Mines, Feb. 4, 1873. 12 pp. <Eighth Report, 1872, pp. 478–489.

99

BROADHEAD, G. C.—Mineral Springs of Missouri. By Garland C. Broadhead. (Read before the St. Louis Academy of Science, October 18, 1864.) 5 pp. <Second Report, 1866, pp. 99–103.

100

BROADHEAD, G. C.—Caves in Missouri. (From Missouri Republican. Nov. 7, 1863.) 4 pp. <Third Report, 1867, pp. 201–204.

¹The first report of the series was that for 1865. They have been published in German, as well as in English, and a part of them in some other languages.

101

BROADHEAD, G. C.—Paints and Clays [of Missouri.] 2 pp. <Third Report, 1867, pp. 200-201.

102

BROADHEAD, G. C.—The Relation of the Soils of Missouri to Geology. Lecture delivered in the University Chapel, March 29, 1884. 10 pp. <Seventeenth Report, 1885, pp. 159-168.

103

BROADHEAD, G. C.—Sketch of Geology of Missouri. 10 pp. <Eighteenth Report, 1885, pp. 250-259.

104

ELLIOTT, R. S.—The Minerals of Missouri. Address before State Board of Agriculture and Members of the Legislature of Missouri, in the Hall of the House of Representatives, at Jefferson City, Jan. 30, 1868, by R. S. Elliott, of St. Louis. 16 pp. <Third Report, 1867, pp. 228-243.

105

GWYNN, J. K.—Southwest Missouri, Its Possibilities and Resources. By J. K. Gwynn. <Twenty-second Report, 1889-90, pp. 260-267.

About half a page is here devoted to a brief reference to the lead, zinc, coal, iron and other deposits of this section of the State.

106

MAGWIRE, J.—The advantages and adaptability of St. Louis as a manufacturing city. By John Magwire. 29 pp. <Second Report, 1866, pp. 122-140.

The mineral advantages are especially considered.

107

MILLIGAN, E.—Missouri Mines. By Ed. Milligan. 2 pp. <First Report, 1865, pp. 161-162 of Appendix. <Appendix Senate Journal, Adjourned Session, 23d General Assembly. Jefferson City, 1865-6; pp. 161-162.

108

MILLIGAN, E.—Missouri as a Manufacturing State. What Nature has Done for Her. 8 pp. <Second Report, 1856, pp. 115-122.

109

MOREHOUSE, A. P.—Northwest Missouri, Its Resources and Possibilities. By Ex-Gov. Albert P. Morehouse. <Twenty-second Report, 1889-90, pp. 242-251.

Refers to existence of coal in the northwestern counties.

110

MORSE, L. D.—Report of the Corresponding Secretary. By L. D. Morse. <First Report, 1865, pp. 7-132. <Appendix Senate Journal, Adjourned session, 23d General Assembly, 1865-6, pp. 151-276.

This has copy of the resolutions of the State Agricultural Society in 1854 in favor of a Geological Survey. p. 9.

Also, "The Importance of a Scientific Survey," pp. 129-132, in which is given the action of the State Board of Agriculture on the same subject at its meeting December 27, 1865.

111

PHILLIPS, J. V.—The Wine District of Missouri. By J. Vancleve Phillips, Geologist and Mining Engineer. 10 pp. <Third Report, 1867, pp. 72-81.

112

RIPPEY, M.—Northeast Missouri. By Maud Rippey. <Twenty-second Report, 1889-90, pp. 237-242.

This contains a paragraph referring to the existence of coal in the northeastern counties.

113

SANBORN, J. W.—Resources of Missouri. <Seventeenth Report, 1883. J. W. Sanborn, Secretary, pp. 150-158.

The mineral and other resources of the State are detailed.

114

SPENCER, J. W.—Primitive Origin of Soils. By J. W. Spencer, Ph. D., F. G. S., Professor of Geology, University of Missouri. 11 pp. <Eighteenth Report, pp. 380-390.

115

STATE BOARD.—Report of the Committee and action of the Board of Agriculture in regard to establishing the offices of State Geologist and State Entomologist, December 5, 1867. 2 pp. <Third Report, 1867, pp. 17-18.

116

SWALLOW, G. C.—Physical Geography of Missouri. From the unpublished notes of the Geological Survey. By G. C. Swallow. 42 pp. <Second Report, 1866, pp. 58-96.

117

SWALLOW, G. C.—Practical and Scientific Agriculture. 9 pp. <Second Report, 1866, pp. 164-172.

The connection of Geology with the soils of Missouri is considered.

118

SWALLOW, G. C.—Agricultural Education. Address of Professor G. C. Swallow, delivered before the State Board of Agriculture, in the House of Representatives, at Jefferson City, January 29, 1868. <Third Report, 1867, pp. 204-215.

This copies the resolutions of the State Agricultural Association in 1865 in favor of a Geological Survey.

119

SWALLOW, G. C.—Grape Culture in Missouri. 13 pp. <Third Report, 1867, pp. 215-227.

Analyses of soils are given and the effect of geological formations on soils considered.

120

SWALLOW, G. C.—Nomenclature and Classifications of Soils. 18 pp. <Thirteenth Report, 1878, pp. 152-169.

121

SWALLOW, G. C.—Missouri Soils. 5 pp. <Fifteenth Report, 1880-1, pp. 277-281.

122

SWALLOW, G. C.—The Tobacco Lands of Missouri. 25 pp. <Fifteenth Report, 1880-1, pp. 282-308.

123

SWALLOW, G. C.—Ozark Highlands. Report on the Agricultural College Lands Lately Sold. By G. C. Swallow, State Geologist, June 1, 1881. 6 pp. <Fifteenth Report, 1880-1, pp. 309-314.

124

THOMPSON, R. O.—The Influence of Mining Industries on Agricultural Pursuits. Our Mineral Deposits and Agricultural and Horticultural Capacities. By R. O. Thompson. 14 pp. <Seventh Report, 1871, pp. 50-63 of the Report of the Corresponding Secretary.

125

TICE, J. H.—Southeast Missouri. Its great and varied mineral and agricultural resources. By John H. Tice, Corresponding Secretary. <Third Report, 1867, pp. 262-269.

126

TICE, J. H.—Board of Agriculture. By John H. Tice. <Second Report, 1866, pp. 160-164.

Mr. Tice, as Secretary of the Board, here advocates that it should have under it a chemist, a geologist, a metallurgist, etc.

127

WILBER, C. D.—Mineral Wealth of Missouri. Two lectures delivered in the Hall of Representatives, Jefferson City, Mo., Feb. 17th and 18th, 1870, in accordance with House Resolutions. I. Mines and Mining Education. II. Coal and Iron. By Professor C. D. Wilber, Inspector of Mining Lands. With an Appendix. 50 pp. <Fifth Report, 1869, pp. 219-269.

As issued in 1870 the pamphlet contains 67 pages.

COUNTY REPORTS MADE TO BOARD OF AGRICULTURE.

(Alphabetical.)

Among the county reports made to the State Board of Agriculture, and published in the Annual Reports, the following are worthy of note as containing interesting matter relating to the geology, mineralogy or mines.

128

ALEXANDER, J. H.—St. Charles County. By Joseph H. Alexander, St. Charles. 18 pp. <First Report, 1865, pp. 87-114.

129

BADGER, A.—Vernon County. By Albert Badger. <Second Report, 1866, pp. 309-313.

130

BODENHAMER, B. J.—Webster County. By B. J. Bodenhamer. <Second Report, 1866, pp. 314–317.

131

BROADHEAD, G. C.—Cass County. By G. C. Broadhead. 4 pp. <Second Report, 1866, pp. 226–229.

This includes both the botany and the geology of the county.

132

CLARK, G. B.—Washington County. By Geo. B. Clark, Secretary Washington county J. S. A. & M. A. <Fifth Report, 1869, pp. 111–115.

133

CLARK, G. B.—Washington County. <Sixth Report, 1870, pp. 125–129.

134

COLLIER, S. C.—Madison County. By S. C. Collier. <Third Report, 1867, pp. 309–312.

135

JEWETT, W. S.—Jefferson County. By W. S. Jewett. <Second Report, 1866, pp. 271–275.

136

MCMANUS, J. P.—Bollinger County. By John P. McManus. <Seventh Report, 1871, pp. 226–229.

137

MOREROD, J. R.—Vernon County. By J. R. Morerod. <Seventh Report, 1871, 314–327.

138

SEARLE, E. P.—Jasper County. By E. P. Searle. <Seventh Report, 1871, pp. 271–282.

“Joplyn” is reported as a mining town only a few months old, and as having two furnaces and from thirty to fifty paying shafts.

139

WHITNEY, D. W.—Franklin County. By D. W. Whitney. <Second Report, 1866, pp. 249–253.

PART II.

Publications of the United States Government.

UNITED STATES GEOLOGICAL SURVEYS.

(Alphabetical.)

140

DAY, D. T. Mineral Resources of the United States. Calendar Year 1885. Division of Mining Statistics [and Technology. David T. Day, Geologist in charge. Dept. of the Interior. U. S. Geological Survey. J. W. Powell, Director, Washington, 1886.

This volume contains the following relating to Missouri:

Missouri coal, pp. 230, 280-282; Coke, pp. 401-402; Copper, p. 112; Iron, p. 14; Iron ores, pp. 97-98; Lead, pp. 147-148; Limestones, p. 541; Limonite, pp. 97-98; Manufactured fertilizers, p. 625; Mineral waters, p. 717; Ocher, p. 709; Zinc, p. 155; Other, pp. 18, 282, 98, 533.

141

— Mineral Resources of the United States. Calendar Year 1886. David T. Day, Chief of Division of Mining Statistics and Technology. Dept. of the Interior. U. S. Geological Survey. J. W. Powell, Director. Washington, 1887.

This volume contains the following:

Missouri barites, p. 525; Coal, pp. 11, 35-36; Copper, p. 210; Feldspar, p. 523; Fertilizers, p. 469; Iron, p. 182; Lead, p. 259; Manganese, pp. 346-348; Mineral waters, p. 538; Ocher, p. 528; Missouri Zinc company, p. 273.

142

— Mineral Resources of the United States. Calendar Year 1887. David T. Day, Chief of Division of Mining Statistics and Technology. Dept. of the Interior. U. S. Geological Survey. J. W. Powell, Director. Washington, 1888.

This volume contains the following:

Missouri mineral localities, pp. 750-753; Iron, pp. 16 and 46-47; Lead, p. 110; Coal, p. 272; Copper, p. 69; Mineral waters, p. 684; Natural gas, p. 495.

143

DAY, D. T.—Mineral Resources of the United States. Calendar Year 1888. David T. Day, Chief of Division of Mining Statistics and Technology. Dept. of the Interior. U. S. Geological Survey. J. W. Powell, Director. Washington, 1890.

This volume contains the following:

Brick production, pp. 561, 565; Cement from natural rock, p. 551; Coal, pp. 171, 199, 200, 285-289; Coke, pp. 395, 397, 398, 400, 404, 405, 407, 411-412; Iron, pp. 14, 23; Lime, pp. 555, 556; Limestone, p. 540; Mineral Springs, pp. 627, 630; Spelter, p. 92; Steel, p. 14; Structural material, p. 528.

144

FEATHERSTONHAUGH, G. W.—Geological report of the Examination made in 1834 of the Elevated Country between the Missouri and Red Rivers. By G. W. Featherstonhaugh, U. S. Geologist. Washington, 1835. 97 pp.

145

FOSTER, J. W. AND WHITNEY, J. D.—Report on the Geology of the Lake Superior Land District: by J. W. Foster and J. D. Whitney, United States Geologists. Part II. The Iron Region, together with the General Geology. 37 plates, 3 maps. Washington, 1851. Special Session, March, 1851. Executive No. 4. Plates. 406 pp.

An account of the Iron Ores of Missouri is given on pages 61-63.

146

HALL, J.—Observations on the Carboniferous Limestone of the Boundary Survey Collections, and its relations with the Carboniferous Limestones of the Mississippi Valley. By James Hall of Albany, New York. 4 pp. <Report of the United States and Mexican Boundary Survey. Vol. I, Part II: pp. 122-125, 1857. Quarto.

147

HALL, J.—Letter from Prof. James Hall of New York, containing observations on the geology and palæontology of the country traversed by the expedition, and notes upon some of the fossils collected on the route. <Exploration and Survey of the Valley of the Great Salt Lake of Utah, including a reconnoissance of a new route through the Rocky Mountains. By Howard Stansbury, Washington, 1853. Appendix E. 399-414.

It would seem from the letter that the specimens below named were collected on the Kansas side of the river, but the locality given in the descriptions would show them to be from the Missouri side of the river, and in one case the

statement is expressly made that the locality was on the east side. All the species are from limestone of the Carboniferous period from the Missouri river 'near,' 'above' or 'below' Weston, which is in Platte county, Missouri.

Spirifer triplicata, page 410, Pl. IV, Fig. 5, *a, b, c*.

Nucula arata, page 413, Pl. II, Fig. 5, *a, b*.

Pleurotomaria coronula, page 413, Pl. II, Fig. 6, *a, b, c, d*.

Productus (sp. indet.) page 411, Pl. III, Fig. 4.

Terebratula subtilita, page 409, Pl. IV, Fig. 1, *a, b, 2, a, b*.

Spirifer hemiplicata, page 409, Pl. IV, Fig. 3, *a, b*.

The following are also figured and redescribed:

S. octoplicatus? Sowerby (*Spirifer Kentuckyensis*, Shum.), page 409, Pl. IV, Fig. 4, *a, b*.

Chonetes variolata, DeKoninck, page 410, Pl. III, Fig. 1, *a, b*.

Productus costatus (?), Sowerby, page 411, Pl. III, Fig. 2.

148

HUMPHREYS, A. A. AND ABBOT, H. L.—Report upon the Physics and Hydraulics of the Mississippi River, to the Bureau of Topographical Engineers, War department. By Capt. A. A. Humphreys and Lieut. H. L. Abbot. J. B. Lippincott & Co., Phil., 4to. 456 pp. and app., 146 pp., maps and charts.

149

HUMPHREYS, A. A. AND ABBOT, H. L.—Report upon the Physics and Hydraulics of the Mississippi river, etc. Reprinted with Additions. Washington, 1876. 4to. xxiii and 691 pp.

This is No. 13 of the Professional Papers of the Corps of Topographical Engineers of the U. S. Army. It contains the geology of the banks of the river.

150

LEWIS AND CLARKE.—Travels to the Source of the Missouri River and across the American Continent to the Pacific Ocean, performed by order of the Government of the United States in the years 1804, 1805 and 1806. By Captains Lewis and Clarke; published from the official report, and illustrated by a map of the route and other maps. London: Printed for Longman, Hurst, Rees, Orme & Brown. Paternoster Row. 1814. Quarto.¹

151

LONG, S. H.—Account of an expedition from Pittsburg to the Rocky Mountains, performed in the years 1819 and 1820, under command of Major S. H. Long. Philadelphia. 1823. The Atlas accompanying it was issued in 1822.

¹Dr. Elliott Cones, U. S. A., in Bulletin No. 6 of the U. S. Geological and Geographical Survey of the Territories, gives the bibliography of fifteen other editions or rewritings of this work, and two editions of the President's Message transmitting it to Congress.

152

MARCOU, JULES AND J. B.—*Mapoteca Geologica Americana*. A Catalogue of Geological Maps of America (North and South) 1752-1881. In geographic and chronologic order. By Jules Marcou and John Belknap Marcou. Washington: Government Printing office, 1884. 184 pp.

This is Bulletin No. 7 of the U. S. Geological Survey.

153

NICOLLET, I. N.—Report intended to illustrate a map of the Hydrographical Basin of the Upper Mississippi River, made by I. N. Nicollet while in employ under the Bureau of the Corps of Topographical Engineers. Feb. 16, 1841.—Ordered to be printed, and 200 additional copies for the use of the Senate. Washington: Blair & Rives, Printers. 1843. 168 pp.

Information is given in regard to the rocks of the Mississippi and Missouri rivers.

154

OWEN, D. D.—Description of the Carboniferous Rocks of Iowa, including that of a Coal-field west of the Mississippi, lying partly in Iowa and partly in Missouri, the extent and limits now for the first time defined in this Report, and laid down on the large Geological Map accompanying it; with descriptions of minute, connected sections, passing in two directions through the heart of this Coal-field; one series along the Valley of the Missouri river; and the other series up the valley of the Des Moines. <Report of a Geological Survey of Wisconsin, Iowa and Minnesota; and incidentally of a Portion of Nebraska Territory. By David Dale Owen. Phil. 1852. 4to.

The above sub-title is Chap. III, pages 90-140.

155

WILLIAMS, A. *Mineral Resources of the United States*. Albert Williams, Chief of Division of Mining Statistics and Technology.

This, the first volume, for 1882, is by Albert Williams, Jr. It contains the following Missouri reports:

Coal of Missouri, pp. 60-61; Lead, p. 312; Nickel of Mine La Motte, p. 403; Missouri Copper, p. 230; Lead and Zinc region of Southwest Missouri, by F. A. Clerk, pp. 368-373; Ores, minerals and mineral substances of industrial importance, reported by John C. Smock; pp. 699-702.

156

WILLIAMS, A. Mineral Resources of the United States. Calendar years 1883 and 1884. Albert Williams, Jr., Chief of Division of Mining Statistics and Technology. Dept. of the Interior. U. S. Geological Survey. J. W. Powell, Director. Washington, 1883.

This volume has: Coal, pp. 51-52; Cobalt, pp. 545-546; Copper, p. 342; Iron ore, pp. 268-270; Lead, pp. 425-427; Lithographic stone, p. 935; Mineral waters, pp. 982-983; Salt, p. 843; Tin, p. 602; Tungsten, p. 574; Zinc, pp. 475-476.

THE UNITED STATES CENSUS REPORT FOR 1880. 4to.

(Alphabetical.)

157

BROADHEAD, G. C.—Missouri, [Building Stones of.] By G. C. Broadhead. <Report on the Building Stones of the United States and Statistics of the Quarry Industry for 1880. Part of Vol. X, pp. 265-274.

This gives a general geological section of the State and a description of the building stone of the different formations.

The above volume also contains a table showing the amount and kinds of rocks quarried in Missouri, at pp. 94-97.

158

CHAUVENET, W. M.—Notes on the Samples of Iron Ore collected in Missouri. By W. M. Chauvenet. <Vol. XV, pp. 403-420.

Many maps, sections and sketches of Missouri mines are given.

159

ELDRIDGE, G. H.—The Industries of the Base Metals (Lead, Zinc and Copper) in the Census Year. By George H. Eldridge. <Vol. XV, pp. 804-830.

160

HILGARD, E. W.—Report on Cotton Production in the United States. By Eugene W. Hilgard, Ph. D. <Vol. V.

This contains a map showing the geology of that part of the State where cotton is raised; also descriptions of it in the text.

161

KILLEBREW, J. B.—Report on the Culture and Curing of Tobacco in the United States. By J. B. Killebrew, Special Agent. <Vol. III.

Chapter x, pp. 94 to 102 relate to Missouri, and the author acknowledges indebtedness to Prof. Swallow for a description of the soils of Missouri, with their geological derivation.

162

LOUGHRIDGE, R. H.—Report on Cotton Production in the State of Missouri, with a brief description of the agricultural features of the State in general, and especially of the cotton producing counties. By R. H. Loughridge, Ph. D., Special Agent. 31 pp. <Vol. V, pp. 493-529.

163

PECKHAM, S. F.—Production, Technology and Uses of Petroleum and its Products. By S. F. Peckham. <Vol. X.

The report notices Bitumen in Missouri, page 20, and Petroleum in Missouri, page 26.

164

PRIME, F.—The Coals of the United States. By Frederick Prime, Jr., Ph. D. <Vol. XV, pp. 603-617.

The "Missouri Coal Field" is disposed of in a single short paragraph at page 616.

165

PORTER, D.—Report of the Water-Power of the Region Tributary to the Mississippi river on the West, below Dubuque, Io. By Dwight Porter, Ph. D. <Vol. XVII.

This contains much relating to the geology of the Missouri streams.

166

PUMPELLE, R.—Report on the Mining Industries of the United States. Geographical and Geological Distribution of the Iron Ores of the United States. By Raphael Pumpelly. <Vol. XV, pp. 3-36.

This has a map, sections and descriptions of the Missouri iron ores.

167

PUMPELLE, R.—Directory of Mines and Metallurgical Establishments East of the 100th Meridian, and of the Mines of Bituminous Coal and Lignite in the Western States and Territories. <Vol. XV.

Coal Mines of Missouri, pp. 896-897; Iron Mines, pp. 948-949; Lead and Zinc Mines, pp. 978-979; Barytes, p. 983; Nickel and Cobalt, p. 987.

AMERICAN STATE PAPERS.

(Chronological.)

168

DESCRIPTION OF THE LEAD MINES IN UPPER LOUISIANA. Communicated to Congress by Amos Stoddard, Captain, First Civil Commandant of Upper Louisiana, dated November 8, 1804. 2nd Session, 8th Congress. No. 103. <Vol. I, pp. 188-191.

This describes the number, extent, situation and names of the lead mines, and gives manner of working the mines and smelting the ore.

169

LEAD MINES IN THE LOUISIANA TERRITORY. Communicated to the House of Representatives, June 25, 1812. 1st Session, 12th Congress. No. 204. <Vol. II, page 380.

This is a report on the lead mines in the northern part of the territory, or what is now Missouri, by Edward Tiffin.

170

LEAD MINES AND SALINES. Report of Alexander McNair, Register for the District of St. Louis, Missouri. 2nd Session, 14th Congress. No. 248. <Vol. III, pp. 235-238.

This document also has "Lead Mines and Salines. Report of Moses Austin, Esq., dated Mine a Burton, Washington county, Missouri Territory." <Same volume, page 238 and map.

The title of the map is: "Sketch of the Lead Mine District in Washington county, Missouri Territory. General Land Office, Dec. 10th, 1816. Joseph Meigs." Scale 2 ms. to 1 inch.

171

LEAD MINES IN MISSOURI. Communicated to the Senate May 7, 1822. 1st Session. 17th Congress. No. 364. <Vol. III, pp. 492-496.

This contains a report from George Bomford, Lieut-Colonel of the Ordnance Department, in which the lead mines of Missouri are described.

172

SALT SPRINGS AND LEAD AND COPPER MINES. Communicated to the House of Representatives March 30, 1824. 1st Session. 18th Congress. No. 406. <Vol. III, pp. 572-614.

This contains a list of the Salt Springs in Missouri on page 572; also Minerals in Missouri, with history, statistics and titles of the lead mines, on pp. 575-614. The latter includes the report of Moses Austin on the lead mines in Ste. Genevieve, Washington and St. Louis counties, on pp. 609-613.

173

LEAD MINES AND SALT SPRINGS. Dated Feb. 7, 1826. 1st Session. 19th Congress. No. 467. <Vol. IV, pp. 369-379.

This is an extended report by Lt.-Col. Bomford, on the manner of mining, kind of ores, situation and extent of mining country in Missouri, with an account of the topography of the country; also Abstract of Leases of Lead Mines in Missouri, by George Graham.

174

LEAD MINES AND SALT SPRINGS IN MISSOURI. Communicated to the Senate by the Chairman of the Committee on Public Lands, December 27, 1826. 2nd Session. 19th Congress. No. 507. <Vol. IV, pp. 590-591.

This contains lists of lands reserved from sale on account of salt springs.

175

LEAD MINES. Communicated to the House of Representatives Jan'y 7, 1828. 1st Session, 20th Congress. No. 568. <Vol. V, pp. 4-6.

This is a report by Lt.-Col. George Bomford on the mines of Missouri.

176

SALE OF THE LEAD MINES IN MISSOURI. Communicated to the House of Representatives January 30, 1828. 1st Session. 20th Congress. No. 593. <Vol. V, pp. 76-77.

178

APPLICATION OF MISSOURI for authority to sell her school lands and salines, and for the sale of the Mineral Lands within her limits. Communicated to the Senate, Jan. 5, 1829. Memorials of the Legislature of Missouri. December 11, 1828. <Vol. V, pp. 199-200.

MISCELLANEOUS DOCUMENTS OF THE UNITED STATES
CONGRESS.*(Chronological)*

179

MESSAGE FROM THE PRESIDENT OF THE UNITED STATES, transmitting the information required by a resolution of the House of Representatives respecting the Lead Mines of Missouri. May 7, 1822. Printed by order of the Senate of the United States. Washington: 1822. 19 pp.

180

LEAD MINES—ILLINOIS AND MISSOURI. Message from the President of the United States, transmitting the information required by a Resolution of the House of Representatives, of 8th May last, in relation to the Lead Mines belonging to the United States, in the States of Illinois and Missouri. Dec. 8, 1826. Read, and laid upon the table. Washington: 1826. 19th Congress, 2nd session. [Doc. No. 7.] Executive. 13 pp.

181

STATEMENT in relation to the Lead Mines and Salt Springs in Missouri. Laid before the Senate by the Chairman of the Committee on Public Lands. December 27, 1826. Printed by order of the Senate of the United States. Washington: 1826. 19th Congress, Second Session. [9.] 6 pp.

182

LEAD MINES. Letter from the Secretary of War, transmitting the information required by a resolution of the House of Representatives of the 2d inst. in relation to the Lead Mines of the United States. January 7, 1828. Read, and referred to the Committee on the Public Lands. Washington: 1828. 20th Congress, 1st Session, Ho. of Reps. War Dept. [Doc. No. 45.] 10 pp.

183

REPORT FROM THE SECRETARY OF WAR in relation to Lead and Lead Mines in Missouri. April 8, 1828. Printed by order of the Senate of the United States. Washington, 1828. 20th Congress, 1st Session. [169.] 7 pp. and 2 folded pages.

184

MESSAGE FROM THE PRESIDENT of the United States, transmitting a report of the Secretary of War, and of the Commissioner of the General Land Office, in relation to the Salt Springs and Lead and Copper Mines. March 30, 1824. Read. Ordered that it lie upon the table. Washington, 1824, 147 pp. 18th Congress, 1st Session. [128.]

185

GEOLOGICAL SURVEY.—Memorial of the Legislature of Missouri, relative to a Geological Survey of that State. Feb. 29, 1849. 30th Congress, 2d Session, Ho. of Reps., Miscellaneous, No. 58, 3 pp.

186

BARNEY, J.—Survey of route from St. Louis to Fulton, made in 1850 by the Bureau of Topographical Engineers, War Dept. By Joshua Barney, C. E.*

187

BARNEY, J.—Report of a Survey from St. Louis to the Big Bend of Red River. By Joshua Barney. Washington. 1852.*

188

JOHNSTON, J. E.—Reconnaissance of a railroad route from Neosho, Mo., to the Rio Grande, by Lt. Col. Joseph E. Johnston. House, Ex. Doc., No. 103. 1st Session, 35th Congress.*

189

NORTHERN BOUNDARY OF MISSOURI. December 31, 1842. Referred to the Committee on the Territories. 27th Congress, 3d Session. Ho. of Reps., Doc. No. 38, 43 pp

190

OWEN, D. D.—Report of a geological exploration of a part of Iowa, Wisconsin and Illinois in 1839. By David Dale Owen. 1840.*

Message President of the United States concerning the Mineral lands of the United States. 1st Sess. 26th Cong. H. R. Ex. Doc. No. 239, pp. 9-115.*

Also republication with slight revision in 1844 in Senate Doc. No. 407 of 28th Congress.*

This is one of the earliest publications proposing the geological classification of the Missouri rocks.

191

OWEN.—Report on Chippewa Land District.*

Contains numerous sections of Carboniferous limestone in Mississippi and Missouri Valleys.

192

MINERAL LANDS.—Report of the Colonel of Ordnance in relation to the Mineral lands of Missouri. Washington, 1836.*

193

BROADHEAD, G. C.—Missouri—its Mineral Resources. 8 pp. <Report of U. S. Commissioner of Statistics, 1889, pp. 461-468.

194

JAMISON, J.—Report on the Coal Fields and Coal Mines on the Western Waters. By J. Jamison. Washington. 1852.

This describes the cannel coal of Callaway county.

195

JOHNSON, W. R.—A Report to the Navy Department of the United States, on American Coals applicable to steam navigation and other purposes. By Walter R. Johnson. Washington. 1844. Senate. 28th Congress. 1st Session. 386.

Contains an analysis of coal from the Osage river, on page 539.

196

PIKE, Z. M.—Account of Expeditions to the Sources of the Mississippi and through the Western Parts of Louisiana, to the Sources of the Arkansaw, Kans, LaPlatte and Piere Juan Rivers: Performed by order of the Government of the United States During the years 1805, 1806 and 1807. And Tour through the Interior Parts of New Spain, when Conducted through these Provinces, by order of the Captain-General, in the year 1807. By Major Z. M. Pike. Phila., 1810; 490 pp., 6 maps, 3 folded tables. Portrait.

197

PIKE, Z. M.—Exploratory Travels through the Western Territories of North America: Comprising a Voyage from St. Louis, on the Mississippi, to the Source of that river, and a Journey through the Interior of Louisiana, and North-eastern provinces of New Spain. Performed in the years 1805, 1806 and 1807, by Order of the Government of the United States. By Zebulon Montgomery Pike,

Major 6th Regt., United States Infantry. London: Printed for Longman, Hurst, Rees, Orme and Brown. Paternoster-Row, 1811. 4°, 436 pp.

198

WHITE, C. A.—Contributions to Invertebrate Paleontology No. 8: Fossils from the Carboniferous Rocks of the Interior States. By C. A. White, M. D. <Twelfth Annual Report of the United States Geological and Geographical Survey for the year 1878, by F. V. Hayden. Washington. 1883; pp. 155-171. 4 plates.

The following species are described:

Chonophyllum Sedaliense, page 157, Pl. 39, Fig. 3a.

Michilinia? *placenta*, page 157, Pl. 39, Figs. 1a, b, c, d.

M. expansa, page 158, Pl. 39, Figs. 2a, b.

Lithostrotion microstylum, page 159, Pl. 40, Fig. 7a, all from the Chouteau Limestone (Kinderhook division Subcarboniferous Series), Sedalia.

Naticopsis monilifera, page 168, Pl. 42, Figs. 3a, b, c, Upper Coal Measures, Pleasant Hill.

Pleurotomaria Broadheadi, page 169, Pl. 42, Figs. 1a, b.

Conularia crustula, page 170, Pl. 42, Fig. 4a, both from the Coal Measures, Kansas City.

The following are noticed as found in Missouri:

Zaphrentis calceola, W. & W. Chouteau limestone at Sedalia.

Rhynchonella Ottumwa, White, St. Louis limestone, various localities.

199

WISLIZENUS, A.—Memoir of a tour to Northern Mexico, connected with Col. Doniphan's Expedition, in 1846 and 1847. By A. Wislizenus, M. D.; [with a scientific appendix and three maps.] (...) Washington: Tippin & Struper, Printers. 1848. Senate Mis. Doc., No. 26, 1st Session, 30th Congress.

This tour was commenced at St. Louis in 1846.

200

WOODWARD, R. S.—Latitudes and longitudes of certain points in Missouri, Kansas and New Mexico, by Robert Simpson Woodward. <United States Geological Survey, J. W. Powell, Director. Bulletin 49, Washington, 1888. 133 pp.

SMITHSONIAN INSTITUTION, ANNUAL REPORTS.

201

BROADHEAD, G. C.—Prehistoric Evidences in Missouri, by G. C. Broadhead. <Report 1879, pp. 350-359. 11 Figs.

Human foot-prints are noticed on pp. 357-359, and accounts of several such Missouri specimens are given.

SMITHSONIAN CONTRIBUTIONS TO KNOWLEDGE.

202

LEIDY, J.—Memoir on the Extinct Species of American Ox. By Joseph Leidy, M. D. 20 pp., 5 plates. <Vol. V, Washington, 1853.

Mentions specimens from New Madrid and from Benton county.

UNITED STATES AGRICULTURAL REPORTS.

203

DODGE.—Mineral Fertilizers of the Mississippi valley. 35 pp. and 3 Geological maps. <Report for 1869, page 548.

The geology and fertilizers of Missouri are given on pp. 560-562, and one of the maps includes the State.

204

SWALLOW, G. C.—Grape-culture in Missouri. By G. C. Swallow. 6 pp. <Report for 1857, page 232.

PART III.

Publications of State Geological Surveys other than that of Missouri.

REPORTS OF THE ARKANSAS GEOLOGICAL SURVEY.

205

OWEN, D. D.—First Report of a Geological Reconnoissance of the Northwestern Counties of Arkansas, made during the years 1857 and 1858. By David Dale Owen. Little Rock. 1858.

The lead bearing formations of Missouri are described on pp. 105-109.

REPORTS OF THE ILLINOIS GEOLOGICAL SURVEY.

206

MEEK, F. B. AND WORTHEN, A. H.—Descriptions of Invertebrates from the Carboniferous System. By F. B. Meek and A. H. Worthen. <Vol. II, pp. 143-423. 1866.

The following Missouri localities are given :

Sphenopterium enorme, M. & W., page 146, Pl. 14, Figs. 1*a*, 1*b*, Kinderhook group, Clarksville.

Rhynchonella Missouriensis, Shumard, page 153, Pl. 14, Figs. 4*a*, 4*b*, Kinderhook group, Chouteau Springs, and numerous other localities.

Spirifer Cooperensis, Swallow, page 155, Pl. 14, Figs. 5*a*, 5*b*, same as last.

Streparollus lens, Hall, page 159, Pl. 14, Figs. 7*a*, 7*b*, Chouteau limestone in Moniteau and adjoining counties.

Nautilus digonus, M. & W., page 163, Pl. 14, Figs. 9*a*, 9*b*, 9*c*, 9*d*, from the Kinderhook group at several places in Central Missouri.

Oligoporus Danae, M. & W., page 249, Pl. 17, Fig. 8, from the Keokuk at Fenton, St. Louis county.

Syntrielasma hemiplicata, Hall, page 323, Figs. 37, *a* and *b*, Upper Coal Measures, Northern Missouri.

Coscium plumosum, Prout, page 414, Pl. 22, Figs. 3, 3*a*, lower beds of St. Louis group, Barretts Station, St. Louis county.

Cyclopora fungia, Prout, page 419, Pl. 22, Figs. 9, 9*a*, 9*b*, Keokuk group, St. Francisville.

207

MEEK, F. B. AND WORTHEN, A. H.—Paleontology of Illinois. <Vol. III, pages 289–565. 1868.

Describes the following species :

Striatopora Missouriensis, page 369, Pl. 7, Fig. 4, from limestone of age of "Shaly limestone," of the New York Lower Helderberg division of the Upper Silurian, Bailey's Landing, Perry county.

Zygospira subconcava, page 380, Pl. 7, Figs. 1a, b, c, d, from limestone of the age of the Delthyris shale of the N. Y. Lower Helderberg, Bailey's Landing, Perry county.

Platyceras subundatum, page 387, Pl. 7, Figs. 13a, b, 14a, b, from limestone representing "Shaly limestone," same locality.

The following localities are also given :

Comarocystites Shumardi, M. & W., page 292, Pl. I, Figs. 1a, b.

C. Shumardi var. *obconicus*, M. & W., page 294, Pl. I, Figs. 2a, b, both from Trenton division of the Lower Silurian at Cape Girardeau.

Edriocrinus pocilliformis, Hall, page 370, Pl. 7, Figs. 5a, b. "Shaly Limestone," Bailey's Landing.

Orthis hybrida, Sowerby ? page 371, Pl. 7, Figs. 7a, b, c, d, same as last.

O. subcarinata, Hall, page 373, Pl. 7, Figs. 6a, b, c, d, same as last.

Strophomena (Strophodonta) cavumbona, Hall ? page 374, Pl. 7, Figs. 10a, b, from Delthyris Shaly limestone, Bailey's Landing.

Merista levis, Vanuxem ? page 376, Pl. 7, Figs. 8a, b, c, same as last.

Trematospira ? imbricata, Hall, page 381, Pl. 7, Figs. 2a, b, c, d, e, same as last.

Cyrtina Dalmani, Hall, page 383, Pl. 7, Figs. 3a, b, same as last.

Spirifer perlamellosus, Hall, page 384, Pl. 7, Figs. 9a, b, same as last.

Platyceras spirale, Hall, page 389, Pl. 7, Figs. 12a, b, c, Lower Helderberg, Bailey's Landing.

P. (Orthonychia) pyramidatum, Hall ? page 389, Pl. 7, Fig. 11, same as last.

Acidaspis hamata, Conrad, page 390, Pl. 7, Fig. 16, same as last.

208

NEWBERRY, J. S. AND WORTHEN, A. H.—Descriptions of New Species of Vertebrates, mainly from the Sub-carboniferous Limestone and Coal Measures of Illinois. By J. S. Newberry and A. H. Worthen. <Vol. II, pages 9–141. 1866.

Describes the following species :

Cladodus spinosus, page 22, Pl. I, Figs. 3, 3a.

C. ferox, page 26, Pl. I, Figs. 11, 11a.

Ctemanthus tenacanthus ? costatus, page 120, Pl. XII, Fig. 2.

C. gracillimus, page 126, Pl. XIII, Fig. 3.

Dactylodus princeps, page 45, Pl. III, Figs. 6, 6a, 6b.

Deltodus rhomboideus, page 100, Pl. IX, Fig. 8.

Homacanthus gibbosus, page 113, Pl. XII, Fig. 1.

H. ? rectus, page 115, Pl. XII, Fig. 6.

Leptocanthus ? occidentalis, page 116, Pl. XII, Fig. 2.

Orodus plicatus, page 63, Pl. IV, Fig. 5, all from the St. Louis Limestone at St. Louis.

Helodus consolidatus, page 87, Pl. VI, Figs. 1, 1a, 2, 2a, from the Keokuk Limestone, St. Francisville.

209

NEWBERRY, J. S. AND WORTHEN, A. H. Descriptions of Fossil Vertebrates. By J. S. Newberry and A. H. Worthen. <Vol. IV, pages 343-374. 1870.

The following species are described:

Cladodus ischypus, page 354, Pl. IV, Figs. 6, 6a.

C. elegans, page 354, Pl. IV, Fig. 9.

Polyrhizodus Littoni, page 357, Pl. IV, Figs. 10, 10a.

Sandalodus crassus, page 369, Pl. IV, Figs. 3, 3a, all from the St. Louis Limestone, St. Louis.

Deltodus Littoni, page 367, Pl. IV, Figs. 8, 8a, from Lower Carboniferous Limestone, Boone county.

Dalmanites tridentiferus, Shumard, page 391, Pl. 7, Fig. 16, Shaly Limestone, Bailey's Landing.

Platyceras? reversum, Hall, page 508, Pl. 15, Figs. 4a, b and annexed cut, Burlington group, at Boonville.

Productus magnus, M. & W., page 528, Pl. 20, Figs. 7 a, b, c, Keokuk of St. Genevieve county.

210

NEWBERRY, J. S. AND WORTHEN, A. H. Descriptions of Invertebrates from Carboniferous System. <Vol. V, pp. 321-619. 1873.

This describes:

Myalina St. Ludovici, Worthen, page 540, Pl. 22, Fig. 3, from the St. Louis Limestone at St. Louis.

It also has description and figure of

conularia Missouriensis, Swallow, page 541, Pl. 22, Fig. 5.

211

WORTHEN, A. H.—Geological Survey of Illinois. By A. H. Worthen. <Vol. I. 1866.

In Chapter III, on Sub-carboniferous Limestone, there are frequent references to the groups of this division in Missouri.

212

ST. JOHN, O. AND WORTHEN, A. H.—Descriptions of Fossil Fishes. By Orestes St. John and A. H. Worthen. <Vol. VI, page 243. 1875.

The following Missouri species are described:

Cladodus eccentricus, page 272, Pl. 4, Fig. 4.

C. englypheus, page 273, Pl. 14, Figs. 1-3.

Desmiodus tumidus, page 339, Pl. Xa, Figs. 7-9.

D. castelliferus, page 341, Pl. Xa, Figs. 10, 11.

Venustodus Leidyi, page 350, Pl. IX, Figs. 1-4.

- Harpacodus occidentalis*, page 355, Pl. Xa, Fig. 2.
Chomatodus incrassatus, page 359, Pl. X, Fig. 18.
Lisgodus selluliformis, page 366, Pl. Xa, Fig. 16.
Tanaodus Prænuntius, page 371, Pl. XI, Figs. 6-10.
T. sculptus, page 373, Pl. XI, Figs. 20-23.
Polyrhizodus amplus, page 387, Pl. XIII, Fig. 13.
Petulorhynchus pseudosagittatus, page 405, Pl. XII, Figs. 1-4.
P. distortus, page 406, Pl. XII, Figs. 7, 8.
Potodus quadratus, page 410, Pl. XIII, Figs. 6, 7.
Ctenacanthus pugiunculus, page 430, Pl. XXI, Fig. 9.
Asteroptychius St. Ludovici, page 437, Pl. XVI, Figs. 3, 4.
Geisacanthus stellatus, page 440, Pl. XXI, Fig. 10.
Drepanacanthus reversus, page 456, Pl. XIX, Figs. 5, 6.
Erismacanthus McCoyanus, page 461, Pl. XXII, Figs. 1-5.
Amacanthus gibbosus, page 464, Pl. XXII, Fig. 6.
Marracanthus rectus, page 466, Pl. XXII, Figs. 7-9.
Gampsacanthus typus, page 472, Pl. XXII, Fig. 12.
G. squamosus, page 473, Pl. XXII, Fig. 13.
Lecracanthus unguiculus, page 476, Pl. XXII, Figs. 10, 11.
Oracanthus consimilis, page 478, Pl. XXII, Fig. 15, all from the St. Louis Limestone at St. Louis.
Lambodus costatus, page 280, Pl. V, Fig. 3.
Desmiodus? ligoniformis, page 342, Pl. Xa, Figs. 12-14.
D? flabellum, page 343, Pl. Xa, Fig. 15.
Lisgodus curtus, page 364, Pl. Xa, Figs. 20-22.
Polyrhizodus Williamsi, page 384, Pl. Xa, Fig. 23; Pl. XIII, Fig. 11.
Physonemus parvulus, page 453, Pl. XVIII, Figs. 11, 12.
Gampsocanthus? latus, page 474, Pl. XXII, Fig. 14, all from the Keokuk at Boonville.
Venustodus tenuicristatus, page 348, Pl. IX, Figs. 19-24, from the Keokuk at St. Francisville and Boonville.
Ctenacanthus Keokuk, page 427, Pl. XV, Figs. 8, a, b, c, d, e, from the Keokuk at Boonville and Legrande.
C. excavatus, page 428, Pl. XV, Figs. 4, 5, from the Keokuk at Legrande.
Batacanthus baculiformis, page 469, Pl. XXI, Figs. 4-8, from the Keokuk at Legrande and St. Francisville.
Lambodus calceolus, page 281, Pl. V, Fig. 5, from the Keokuk at Legrande.
Chomatodus parallelus, page 358, Pl. Xa, Figs. 3, 4, from the Warsaw beds at Boonville.

ST. JOHN, O. & WORTHEN, A. H.—Palæontology of Illinois. Descriptions of Fossil Vertebrates. <Vol. VII. 1883.

The following Missouri species are described:

- Cochliodus VanHornii*, page 120, Pl. VII, Figs. 1-10.
C. obliquus, page 126, Pl. VII, Fig. 17.
Copodus VanHornii, page 229, Pl. XX, Figs. 2, 3.
Deltodopsis St. Ludovici, page 161, Pl. XI, Figs. 2-6.
Deltodus parvus, page 151, Pl. IX, Figs. 1-5.
Deltoptychius expansus, page 98, Pl. V, Figs. 9-13.

- Physonemus falcatus*, page 252, Pl. XXIV, Fig. 6.
Pocilodus St. Ludovici, page 132, Pl. VIII, Figs. 8, 12.
Psammodus plenus, page 213, Pl. XVI, Figs. 1-4; Pl. XVII, Figs. 1-4.
Psephodus latus, page 72, Pl. II, Figs. 1, 3.
Vaticinodus ? simplex, page 84, Pl. IV, Figs. 22-26.
Xystrodus imitatus, page 180, Pl. VIII, Fig. 2, all from the St. Louis Limestone at St. Louis.
Deltodus cinctulus, page 146, Pl. IX, Figs. 6, 7, from the Warsaw beds at Barrett's Station.
Deltoptychius Wachsmuthi, page 93, Pl. V, Figs. 1-5, from the Keokuk at Boonville.

The following species are also figured :

- Ctenacanthus gracillimus*, N. & W.
Drepanacanthus reversus, St. J. & W.
Oracanthus vetustus, Leidy.
Sandalodus spatulatus.
Stenopterodus parvulus, N. & W. all from the St. Louis Limestone at St. Louis.
Orthopleurodus carbonarius, N. & W. Upper Coal Measures of Mo.
Sandalodus laevisimus, N. & W. Keokuk at Boonville.

REPORTS OF THE IOWA GEOLOGICAL SURVEY.

214

HALL, J.—Report on the Geological Survey of the State of Iowa. By James Hall. <Vol. I, Part I. 1858.

There are numerous references to the geology of Missouri in accounts of the Chemung Group, Burlington Limestone, St. Louis Limestone, Coal Measures, and in many other parts of the work.

215

HALL, J.—Report on the Geological Survey of the State of Iowa. By James Hall, State Geologist. <Vol. I, Part II. Palæontology. 1858.

Describes the following species :

- Athyris incrassatus*, page 600, Pl. XII, Fig. 6, from the Burlington Limestone at Hannibal.
Archæocidaris Wortheni, page 700, Pl. XXVI, Figs. 4a-g, from the St. Louis Limestone near St. Louis.
Forbesiocrinus Giddingsi, page 633, Pl. XVII, Figs. 2, 4, from the Keokuk Limestone ? at Boonville.
F. Shumardianus, page 671, Pl. XVII, Fig. 1, from the St. Louis Limestone at St. Louis.
Orthis Michelina var *Burlingtonensis*, page 596, Pl. XII, Figs. 4a, b, from the Burlington Limestone at Hannibal.

O. Swallovi, page 597, Pl. XII, Figs. 5a, b, from the Burlington Limestone at numerous localities.

Pentremites bipyramidalis, page 607, Pl. XV, Fig. 2, from the Keokuk Limestone, State of Missouri.

Productus pyxidatus, page 498, Pl. III, Figs. 8a-c, from calcareous shale and limestone of the age of the Hamilton group at Louisiana.

P. Shumardianus, page 499, Pl. III, Fig. 9, and Pl. VII, Fig. 1, same formation as last at Clarksville.

P. ovasus, page 674, Pl. XXIV; Fig. 1, from the St. Louis Limestone at St. Louis.

Poteriocrinus Missouriensis, page 669, Pl. XVII, Figs. 7 a, b, from the St. Louis Limestone at St. Louis.

Platycrinus Saræ, page 673, Pl. XVII, Fig. 4, from the St. Louis Limestone near St. Louis.

Scaphiocrinus dactyliformis, page 670, Pl. XVII, Fig. 6, from the St. Louis Limestone, St. Louis.

Synbathocrinus Swallovi, page 672, Pl. XVII, Figs. 8, 9, from the same.

The following species are given as found in Missouri, a part of the figures being of Missouri specimens. All of the species are figured except the last:

Lithostrotion mamillare, E. & H.

Orthis Vanuxemi, Hall.

Productus marginicinctus, Prout.

P. costatus var.

Pleurotomaria sphaerulata, Con.

Spirifer Marionensis, Shum.

S. cameratus, Morton.

Terebratula subtilita, Hall.

REPORTS OF THE OHIO GEOLOGICAL SURVEY.

216

MEEK.—A Report on some of the Invertebrate Fossils of the Waverly Group and Coal Measures of Ohio. <Vol. II. Part II. Palæontology. Columbus. 1875.

The following species, which have been described from Missouri, are compared with or made synonyms of other species in the Waverly group:

Allorisma Hannibalensis, Shum.

Avicula Cooperensis, Shum.

Grammysia Hannibalensis, Shum.

Spirifer (Crytia?) Hannibalensis, Swallow.

S. Osagensis, Swallow.

Spirigera Hannibalensis, Swallow.

See also:

Productus ————.

Spirifer (Trigonotreta) opimus, Hall.

REPORTS OF THE PENNSYLVANIA GEOLOGICAL SURVEY

217

LESQUEREUX, L.—Description of the Coal Flora of the Carboniferous formations in Pennsylvania and throughout the United States. By L. Lesquereux. <Second Geological Survey of Pennsylvania. P. Vols. I and II, 1880, and Vol. III, 1884.

The following Missouri species are described :

- Alethopteris ambigua*, page 182, Pl. XXXI, Figs. 1-4, Clinton.
Asterophyllites fasciculatus, page 41, Pl. III, Figs. 1-4, Clinton.
Callipteridium membranaceum, page 172, Pl. XXVII, Fig. 4-8, Clinton.
Conostichus Broadheadi, page 15, Pl. B, Figs. 1-2, from shale near the base of the Coal Measures, Vernon county.
C. prolifer, page 16, Pl. B, Fig. 3, same locality.
Cordaianthus dichotomus, page 546, Pl. LXXXVI, Figs. 6, 6b, Clinton.
Eremopteris Missouriensis, page 295, Pl. LIII, Figs. 8, 8a, Clinton.
Lepidodendron Brittii, page 368, Pl. LXIII, Figs. 1, 2, Clinton.
L. lanceolatum, page 369, Pl. LXIII, Figs. 3-5a, Clinton.
L. cyclostigma, page 394, Pl. LXIII, Fig. 5, Clinton.
L. scutatum, page 369, Pl. LXIII, Figs. 6-6c, Clinton.
Lepidophloios sigillarioides, page 425, Pl. LXVIII, Figs. 8, 8a, Clinton.
Neuropteris Missouriensis, page 104, Pl. VIII, Figs. 5, 6, Clinton.
Odontopteris sphenopteroides, page 139, Pl. XXI, Figs. 3, 4, Clinton.
Pecopteris Clinsoni, page 251, Pl. XLII, Figs. 1-5b, Clinton.
Rhacophyllum membranaceum, page 312, Pl. LVIII, Figs. 1, 2, Clinton.
R. spinosum, page 320, Pl. LVIII, Figs. 4, 5, Clinton.
R. hamulosum, page 321, Pl. LVIII, Fig. 3, Clinton.
Sordocladus ophioglossoides, page 329, Pl. XLVIII, Fig. 11, Clinton.
Sphenopteris Brittii, page 277, Pl. LV, Figs. 2, 2b, Clinton.

The following species are also noticed, mostly from Clinton, and many of them have Missouri specimens figured :

- Alethopteris Serlii*, Brgt.
Callipteridium Sullivanti, Lesqx.
Cordaites communis, Lesqx.
C. diversifolius, Lesqx.
Dictyopteris obliqua, Bunb'y.
Lepidoxylon anomalum, Lesqx.
Megaphyllum Goldenbergii, Weiss.
Neuropteris angustifolia, Brgt.
N. Clarksonii, Lesqx.
N. cordata, Brgt.
N. dilatata, Ll. & Hutt.
N. Loschii, Brgt.
N. rarinervis, Bunb'y.
Pecopteris dentata, Brgt.
P. erosa, Gutb.

- P. pennæformis*, Brgt.
Pseudopecopteris irregularis, St.
Rhacophyllum filiciforme (Gutb.), Schp.
R. hirsutum, Lesqx.
R. fimbriatum, Lesqx.
R. lactuca, Sternb.
Sphenophyllum filiculme, Lesqx.
S. longifolium, Germ.
S. oblongifolium, Germ.
Sphenopteris Dubuissonis, Brgt.
S. Gavenhorstii, Brgt.
S. mixta, Schp.
S. (Hymen.) splendens, Lesqx.
S. (Hymen.) tridactylites, Brgt.
Taonurus Colletti, Lesqx.

PART IV.

Publications of Scientific Societies and Periodicals.

ALBANY INSTITUTE TRANSACTIONS.

218

HALL, J.—Descriptions of New Species of Fossils from the Carboniferous Limestones of Indiana and Illinois. By James Hall. 36 pp. <Vol. IV, page 1.

The fossils described are from Spergen Hill and Bloomington, Indiana. The different beds of the Sub-carboniferous are stated, and localities in Missouri and other parts of the West are given. This paper, with additions by Prof. Whitfield, was republished in Bulletin No. 3 of the American Museum of Natural History, New York.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE PROCEEDINGS.

219

HALL, J.—On the Carboniferous Limestones of the Mississippi Valley. By Professor James Hall, of Albany, N. Y. 19 pp. <10th Meeting, 1856, page 51.

220

KING, H.—Some Remarks on the Geology of the State of Missouri. By Dr. H. King, of St. Louis. 18 pp. <5th Meeting, 1851, page 182.

221

MCADAMS, W.—A New Vertebrate from the St. Louis Limestone. By William McAdams, of Alton, Ill. Abstract, 1 page. <32nd Meeting, 1883, page 269.

222

MACFARLANE, J.—The "Earthquake" at New Madrid, Mo., in 1811, probably not an Earthquake. By James Macfarlane, of Towanda, Penn. Abstract, 2 pp. <32nd Meeting, 1883, page 220.

There is a discussion of this paper in "Science," Sept. 7, 1883.

223

OWEN, D. D.—Abstract of Introduction to the Final Report on the Geological Surveys made in Wisconsin, Iowa and Minnesota, etc. By D. D. Owen, M. D. 13 pp. <5th Meeting, 1851, page 119.

224

SPENCER, J. W.—Sand Boulders in the Drift, or Sub-aqueous Origin of the Drift in Central Missouri. By Prof. J. W. Spencer, University of Missouri, Columbia, Mo. Abstract. 1 page. <36th Meeting, 1887, page 220.

225

SWALLOW, G. C.—Explanations of the Geological Map of Missouri, and a Section of its Rocks. By Prof. G. C. Swallow, State Geologist of Missouri. 21 pp. 1 plate. <11th Meeting, 1857, page 1.

The paper refers to a map as accompanying it, but this was not found in the copies examined.

226

— Quaternary Deposits of Missouri. 19 pp. 1 plate. <11th Meeting, 1857, page 21.

227

— Grape Culture in Missouri. 15 pp. 1 plate. <12th Meeting, 1858, page 268.

228

— Remarks on the Geological Map and Section of the Rocks of Missouri. Abstract. 1 page. <20th Meeting, 1871, page 262.

229

TODD, J. E.—On the Annual Deposit of the Missouri River, during the Post-pliocene. By J. E. Todd, of Tabor, Iowa. Abstract. 5 pp. <26th Meeting, 1877, page 289.

230

TODD, J. E.—Richthofen's Theory of the Loess, in the Light of the Deposits of the Missouri. 9 pp. <27th meeting, Vol. XXVII, 1878, page 231.

231

TROWBRIDGE, S. H.—Remarks on the Classification and Distribution of Producti. By S. H. Trowbridge, of Glasgow, Mo. 12 pp. <30th Meeting, 1881, page 193.

AMERICAN CHEMICAL SOCIETY TRANSACTIONS.

232

WILLIAMS, C. P.—Analysis of Mine Water from the Lead Region of Southwest Missouri. By C. P. Williams. <Vol. I, page 179. [1877.]

AMERICAN EXCHANGE AND REVIEW.

233

EDITORIAL.—Mining and Metallic Production in the United States. pp. 13, 9, 9 and 10. <Vol. III, Nos. 3, 4, 5 and 6, April to July, 1863.

AMERICAN GEOLOGIST.

234

BROADHEAD, G. C.—The Geological History of the Ozark Uplift. By G. C. Broadhead. Read before the A. A. A. S., 1888. 8 pp. <Vol. III, No. 1, page 6. Jan., 1889.

235

— The Missouri River. 8 pp. <Vol. IV, No. 3, page 148. Sept., 1889.

236

CLAYPOLE, E. W.—The Story of the Mississippi-Missouri. By Dr. E. W. Claypole, Akron, O. 17 pp. <Vol. III, No. 6, page 361. June, 1889.

237

EDITORIAL.—Notice of article of J. W. Spencer in American Naturalist, on "Sand-boulders in the drift; or sub-aqueous origin of the drift in Central Missouri." 2 pp. <Vol I, No. 2, page 120. Feb. 1888.

238

HAWORTH, E.—A Contribution to the Archæan Geology of Missouri. By Erasmus Haworth. 38 pp. 1 pl. <Vol. I, Nos. 5 and 6, pages 287 and 382.

239

ROWLEY, R. R.—The Chouteau Group of Eastern Missouri. By R. R. Rowley. 6 pp. <Vol. III, No. 2, page 111. Feb. 1889.

240

—Observations on the Kinderhook Fossils. 2 pp. <Vol. III, No. 4, page 275. April, 1889.

AMERICAN INSTITUTE OF MINING ENGINEERS TRANSACTIONS.

241

BIRKINBINE, J.—Prominent Sources of Iron-Ore Supply. By John Birkinbine, Philadelphia, Pa. 14 pp. <Vol XVI, page 715. 1889.

242

BROADHEAD, G. C.—The Southeast Missouri Lead District. By Prof. G. C. Broadhead, Pleasant Hill, Mo. 7 pp. <Vol. V, page 100.

This was also published in the Engineering and Mining Journal.

243

DEWEY, F. B.—The Lewis and Bartlett Bag-Process of Collecting Lead-Fumes at the Lone Elm Works, Joplin, Missouri. By F. P. Dewey. Washington, D. C., 31 pp. <Vol. XVIII (Washington Meeting, February, 1890).

244

GAGE, J. R.—On the Occurrence of the Lead Ores in Missouri. By James R. Gage, M. E., St. Louis. 10 pp. <Vol. III, page 116.

245

MUNROE, H. S.—The New Dressing Works of the St. Joseph Lead Company, at Bonne Terre, Missouri. By H. S. Munroe, School of Mines, New York City. 20 pp. and 3 plates. <Vol. XVII, p. 659, Oct. 1888.

246

MUNROE.—The English versus the continental system of jigging—is close sizing advantageous? 23 pp. <Vol. XVII, page 637.

247

NEILL, J. W.—Notes on the Treatment of Nickel-Cobalt Mattes at Mine La Motte. By James W. Neill, E. M., Mine La Motte, Mo. 5 pp. <Vol. XIII, page 634, Feb. 1885.

248

NEWTON, H.—The Ores of Iron; their Geographical Distribution and Relation to the Great Centres of the World's Iron Industries. By Henry Newton, E. M., New York City. 32 pp. <Vol. III, page 360.

This has account of the Specular iron ores of Missouri.

249

NICHOLSON, F.—A Review of the Ste. Genevieve Copper Deposit. By Frank Nicholson, E. M., Ste. Genevieve. 13 pp. <Vol. X, page 444, 1882.

250

PACK, J. W.—Process of Spelter Production as Practiced at Carondelet, Missouri, with Comparisons. By John W. Pack, Rolla, Missouri. 6 pp. <Vol. III, page 125.

251

PRIME, F.—A Catalogue of Official Reports upon Geological Surveys of the United States and Territories, and of British North America. By Frederick Prime, Jr., Assistant Geologist of Pennsylvania. 71 pp. <Vol. VII, page 455. 1879.

252

PRIME.—Supplement I to a Catalogue of Official Reports, etc. 13 pp. <Vol. VIII, page 466. Feb. 1880.

253

RAYMOND, W.—Note on the Zinc Deposits of Southern Missouri. By Rossiter W. Raymond, Ph. D., New York City. 3 pp. <Vol. VIII, page 165. Sept., 1879.

254

WAIT, C. E.—Note on the New* Chemical Laboratory of the Missouri School of Mines. By Professor Charles E. Wait, Rolla, Missouri. 5 pp., 3 Figs. <Vol. XV., page 21.

This was also issued as a pamphlet. Rolla, June, 1886, 14 pp., 16mo.

255

WILLIAMS, C. P.—Some Points in the Treatment of Lead Ores in Missouri. By Professor C. P. Williams, Ph. D., Rolla, Missouri. 16 pp. <Vol. V, page 314.

256

WILLIAMS, C. P.—Notes on the Method of Preparation of Zinc Oxide. By C. P. Williams. <Vol. V, pp. 422-426.

The ore noticed was from Hopewell, Washington County.

AMERICAN JOURNAL OF SCIENCE AND ARTS.

257

ADAMS, W. A.—Foot-marks and other Artificial Impressions on Rocks. By Prof. W. A. Adams, Zanesville, Ohio. 3 pp. <Vol. XLIV, page 200. 1843.

258

ANDREWS, E.—Dr. Koch and the Missouri Mastodon. By Edmund Andrews, M. D., Prof. of Surgery in the Chicago Medical College. 3 pp. <Vol. X, Third Series, page 32. 1875.

259

ANONYMOUS.—Calamine in Missouri. (Copied from New Harmony Gazette.) 3 pp. <Vol. XII, page 376.

260

ANONYMOUS.—Cobalt in Missouri. (Copied from New Harmony Gazette.) 1 page. <Vol. XII, page 378.

261

—Belcher's Artesian Well in St. Louis. (From the St. Louis Republican.) 3 pp. <Vol. XV, Second Series, page 460. 1853.

262

BARNARD, F. A. P.—Physics and Hydraulics of the Mississippi River. [By Prof. F. A. P. Barnard.] 9 pp. <Vol. XXXIII, Second Series, page 181. 1862.

263

BARNARD, F. A. P.—Physical Geography of the Report on the Mississippi River, by Humphrey and Abbot. [By Prof. F. A. P. Barnard.] 11 pp. <Vol. XXXV, Second Series, page 223. 1863.

264

BOURNE, A.—On the Prairies and Barrens of the West. By A. Bourne 5 pp. <Vol. II, page 30. 1820.

265

BRINGIER, L.—Notice of the Geology, Mineralogy, Topography, Productions, and Aboriginal inhabitants of the regions around the Mississippi and its confluent waters—in a letter from L. Bringier, Esq., of Louisiana, to Rev. Elias Cornelius—Communicated for this Journal. 32 pp. <Vol. III, page 15. 1821.

266

BROADHEAD, G. C.—Note on Pickeringite from Missouri. By G. C. Broadhead. 1 page. <Vol. VII, Third Series, page 520. 1874.

267

—On the Height of the St. Louis Directrix. 1 page. <Vol. X. Third Series, page 75. 1875.

268

—On a discovery of Meteoric Iron in Missouri. (From Mines, Metals and Arts, for Sept. 20, 1875.) 1 page. <Vol. X, Third Series, page 401. 1875.

269

BROADHEAD, G. C.—Drift formation and Gold in Missouri. (From Mines, Metals and Arts, St. Louis, Dec. 9, 1875.) 1 page. <Vol. XI, Third Series, page 150. 1876.

270

—On Barite Crystals from the Last Chance Mine, Morgan County, Missouri; and on Gæthite from Adair County, Missouri. 2 pp. <Vol. XIII, Third Series, page 419. 1877.

271

—Origin of the Loess. 2 pp. <Vol. XVIII, Third Series, page 427 1879.

272

DANA, J. D.—On Dr. Koch's Evidence with regard to the Cotemporaneity of Man and the Mastodon in Missouri. By James D. Dana. (Article and note.) 12 pp. and 1 page. <Vol. IX, Third Series, pages 335 and 398. 1875.

This was reprinted in *Pop. Sci. Rev.* Vol. XIV, pp. 278-290.

273

DANA, E. S. and PENFIELD, S. L.—On Artificial Crystallized Lead Silicate; by Edward S. Dana and Samuel L. Penfield. 2 pp. <Vol. XXX, Third Series, page 138.

274

EDITORIAL.—Notice of "A View of the Lead Mines of Missouri, including some observations on the Mineralogy, Geology, &c., by Henry R. Schoolcraft." 14 pp. <Vol. III, page 59. 1821.

275

—The Mammoth (Mastodon ? Eds.) (Copied from Phil. Presbyterian of Jan. 12, 1839.) 3 pp. <Vol. XXXVI, page 198.

276

—Mastodon Giganteus. 3 pp. <Vol. II, Second Series, page 131. 1846.

This has a cut of the Koch Mastodon from Missouri, now in the British Museum.

277

EDITORIAL.—Gigantic Palæotherium. <Vol. —, page 288.

This notices the remains of a Palæotherium found "in the territory near St. Louis," but instead of having been found near St. Louis, it was found in the Northwest on the Upper Missouri.

278

—“On the Coal Measures of Missouri: by G. C. Swallow.” 3 pp. <Vol. XXVI, Second Series, page 113.

279

—Notice of “Descriptions of New Species of Blastoidea from the Palæozoic rocks of the Western States, with some observations on the Structure of the Summit of the Genus Pentremites; by B. F. Shumard, M. D.” 1 page. <Vol. XXVI, Second Series, page 127.

280

—Notice of “Observations on the Geology of the County of Ste. Genevieve, being an extract from the Report made to the Missouri Geological Survey in 1859; by B. F. Shumard, M. D.” (Transactions St. Louis Acad. Sci.) 1 page. <Vol. XXIX, Second Series, page 126. 1860.

281

—Notice of “Third Series of Descriptions of Bryozoa, from the Palæozoic Rocks of the Western States and Territories; by H. A. Prout.” (Trans. St. L. Acad. Sci.) 2 pp. <Vol. XXIX, Second Series, page 126. 1860.

282

—Dr. Engelmann’s Measurement of the Elevation of St. Louis above the Gulf of Mexico. 3 pp. <Vol. XXX, Second Series, page 394. 1860.

283

—Notice of “Observations upon the rocks of the Mississippi Valley which have been referred to the Chemung Group of New York, together with descriptions of new species of fossils from the same horizon at Burlington, Iowa: by C. A. White and R. P. Whitfield.” 4 pp. <Vol. XXXIII, Second Series, page 422. 1862.

284

EDITORIAL.—Notice of "Geological Survey of Missouri: Raphael Pumpelly, Director. Preliminary Report on the Iron Ores and Coal Field from the field work of 1872." 2 pp. <Vol. VII, Third Series, page 61, 1874.

285

—Artesian Boring at the St. Louis Insane Asylum. 2 pp. <Vol. IX, Third Series, page 61. 1875.

286

—Notice of "Geological Sketch of the State of Missouri, illustrated by maps: by Geo. C. Swallow. 10 pp. large 4to. St. Louis. 1873. R. A. Campbell." 1 page. <Vol. IX, third Series, page 63. 1875.

287

—Notice of "Report of the Geological Survey of Missouri, including field work of 1873-4." 3 pp. <Vol. IX, Third Series, page 148. 1875.

288

—Forms and Origin of the Lead and Zinc deposits of Southwestern Missouri: by Adolf Schmidt. Abstracted from paper in Trans. St. Louis Acad. Sci. 2 pp. <Vol. X, Third Series, page 300. 1875.

289

—Remains of the Quaternary Peccary, *Platygonus Compressus*. 1 page. <Vol. XXXIX, page 322. 1890.

This gives Benton county as one of the localities where this fossil has been found.

290

ENGELMANN, G.—Remarks on the *Melonites multipora*. By G. Engelmann, M. D. 2 pp. <Vol. III, Second Series, page 124.

291

ENGELMANN.—Remarks on the St. Louis Limestone. 2 pp. <Vol. III, Second Series, page 119. 1847.

292

FLINT.—Earthquakes on the Mississippi; extracted from the travels of Mr. Flint. <Vol. XV, page 366.

293

- HALL, J.—Note upon the Geology of the Western States. By James Hall, State Geologist of New York. 12 pp. <Vol. XLIII, page 51. 1842.

294

- HALL.—Observations upon the Carboniferous Limestones of the Mississippi Valley. [Abstract.] 17 pp. <Vol. XXIII, Second Series, page 187. (From the proceedings of the American Association for the Advancement of Science.) See also Report of Progress of the Iowa Geological Survey.

295

- HALL.—Remarks upon the Genus *Archimedes* or *Fenistella* from the Carboniferous Limestones of the Mississippi Valley. 2 pp. <Vol. XXIII, Second Series, page 203.

296

- HARLAN, R.—Notice of two New Fossil Mammals from Brunswick Canal, Georgia; with observations on some of the fossil quadrupeds of the United States. By R. Harlan, M. D. 5 pp. <Vol. XLIII, page 141. 1842.

Notices the mastodon remains of the Koch collection, and gives his conclusion that the genus "*Tetracaulodon*," founded on them, was not good. His paper showing this had been published in his Medical and Physical Researches, page 257, and in Jameson's Edinburg Journal.

297

- HARLAN, R.—Description of the Bones of a New Fossil Animal of the order Edentata. 12 pp. 3 plates. <Vol. XLIV, page 69. 1843.

This describes

Orycterotherium Missouriense, page 69, Pl. I, Figs. 1 to 18; Pl. II, Figs. 1 to 5; Pl. III, Figs. 1 to 9, from the Pomme de Terre, Benton county.

298

- HARLAN, R.—Remarks on Mr. Owen's Letter to the Editors on Dr. Harlan's New Fossil Mammalia. 4 pp. <Vol. XLV, page 208. 1843.

299

- HERRICK, E. C.—Fall of a Meteorite in Missouri, February 13, 1839. By E. C. Herrick. 2 pp. <Vol. XXXVII, page 385. 1839.

300

- HILGARD, E. W.—Remarks on the Drift of the Western and Southern States, and its Relation to the Glacier and Iceberg Theories. By Eug. W. Hilgard, Ph. D., State Geologist of Mississippi. 5 pp. <Vol. XLII, Second Series, page 343. 1866.

301

- HODGE, J. T.—On the Wisconsin and Missouri Lead Region. By James T. Hodge. 38 pp. <Vol. XLIII, page 35. 1842.

302

- HORNER, W. F.—Extracts from the Proceedings of the Am. Phil. Soc., containing an abstract of "Note of the Remains of the Mastodon, and some other extinct animals, collected together in St. Louis, Missouri; by W. E. Horner, M. D., Professor of Anatomy, University of Pennsylvania." 4 pp. <Vol. XL, page 56.

This is an account of the Koch collection.

303

- HUNT, T. S.—On some Reactions of the Salts of Lime and Magnesia, and on the Formation of Gypsums and Magnesian Rocks. By T. Sterry Hunt, F. R. S., of the Geological Survey of Canada. 19 pp. <Vol. XXVIII, Second Series, page 365, 1859.

This is part of an article continued from page 187 of the same volume. The part here given notices the magnesian limestones of Missouri.

304

- The Decay of Rocks Geologically considered. <Vol. XXVI, pp. 190-213.

The rocks of Missouri are considered on page 207.

305

- On some points in American Geology, 21 pp. <Vol. XXXI, Second Series, page 392.

306

- KEYES, C. R.—The Carboniferous Echinodermata of the Mississippi Basin. By Charles R. Keyes. 8 pp. <Vol. XXXVIII, Third Series, page 186.

307

KOCH, A.—Remains of the Mastodon in Missouri. [Communicated from A. Koch, proprietor of the St. Louis Museum, to the St. Louis Com. Bulletin, June 25, 1839. Copied in the Phil. Nor. Am., July 11, 1839.] 2 pp. <Vol. XXXVII, page 191. 1839.

308

KUNZ, G. F.—On some American Meteorites. By George F. Kunz. 11 pp. 1 plate. <Vol. XXXIV, Third Series, page 467.

A description with plate is given of the Taney County meteorite.

309

LECONTE, J. L.—Plumbo-resinite and Cupreous Sulphato-carbonate of Lead in Missouri. By J. L. LeConte, M. D. 1 page. <Vol. III. Second Series, page 117. 1847.

310

LOCKE.—The lead regions of the Upper Mississippi, with remarks on the geology of the west. By Prof. — Locke. 3 pp. <Vol. XLII, pages 147-149. 1842.

311

MEEK, F. B. AND WORTHEN, A. H.—Remarks on the Age of the Goniatite Limestone at Rockford, Indiana, and its relations to the "Black Slate" of the Western States, and to some of the succeeding rocks above the latter. By F. B. Meek and A. H. Worthen. 11 pp. and note. <Vol. XXXII, Second Series, pages 167 and 288. 1861.

312

NICOLLET, J. N.—On the Mineral region of the State of Missouri. By J. N. Nicollet. 2 pp. <Vol. XLV, page 340. 1843.

The above is in an abstract of the Proceedings of the Fourth Session of the Association of American Geologists and Naturalists.

313

NIPHER, F. E.—The Magnetic Survey of Missouri. By Francis E. Nipher. <Vol. XXI, pp. 310-312, 1881.

314

- NORWOOD, J. G. & OWEN, D. D.—Description of a remarkable fossil Echinoderm, from the Limestone Formation of St. Louis, Missouri. By J. G. Norwood, M. D., and D. D. Owen, M. D. 4 pp. <Vol. II, Second Series, page 225, 1846.

This describes *Melonites multipora*, page 225, Figs. 1, 2, 3.

315

- OWEN, R.—Letter from Richard Owen, Esq., F. R. S., F. G. S., &c., &c., on Dr. Harlan's Notice of New Fossil Mammalia. 5 pp. <Vol. XLIV, page 341. 1843.

316

- OWEN, D. D.—Regarding Human Foot-Prints in Solid Limestone, with a plate. By David Dale Owen, M. D., of Indiana. 19 pp. 1 plate. <Vol. XLIII, page 14. 1842.

317

- PARKER, J. D.—On the Fall of a Meteorite in Kansas City, Missouri, in June, 1878. By John D. Parker. 1 page. <Vol. XII, Third Series, page 316. 1876.

318

- PUMPELLE, R.—The Relation of Secular Rock-disintegration to Loess, Glacial Drift and Rock Basins. By Raphael Pumpelly. 12 pp. <Vol. XVII, Third Series, page 133. 1879.

319

- RICHARDSON, J.—Note on the Mastodon (?) and the Elephas primigenius. By Sir John Richardson. 2 pp. <Vol. XIX, Second Series, page 131. 1855.

320

- SCHOOLCRAFT, H. R.—Remarks on the Prints of Human Feet, observed in the Secondary Limestone of the Mississippi Valley. By Henry R. Schoolcraft. 9 pp. 1 plate. <Vol. V, page 223.

321

- SEAMON, W. H.—The Zinciferous Clays of Southwest Missouri and a theory as to the growth of the Calamine of that section. By W. H. Seamon. <Vol. XXXIX, pp. 38-42. 1890.

322

SHUMARD, B. F.—Supposed fall of Meteoric iron at St. Louis, Mo. By B. F. Shumard. 2 pp. <Vol. XXXIV, Second Series, page 443. 1862.

323

TROOST & LESUEUR.—Lead Ores in Missouri: by Messrs. Troost and Lesueur. (Copied from New Harmony Gazette.) 2 pp. <Vol. XII, page 379.

324

WHEELER, H. A.—Further Notes on the Artificial Lead Silicate from Bonne Terre, Mo. By H. A. Wheeler. 2 pp. <Vol. XXXII, Third Series, page 272.

325

WINCHELL, A.—On the identification of the Catskill Red Sandstone Group with the Chemung. By Prof. A. Winchell. 2 pp. <Vol. XXXV, Third Series, page 61.

The author of this paper holds to the equivalency of the Chemung, Marshall, Ohio, Rockford, Burlington and Chouteau strata, and that they are all Carboniferous.

AMERICAN MUSEUM OF NATURAL HISTORY BULLETIN.

326

WHITFIELD, R. P.—On the Fauna of the Lower Carboniferous Limestones of Spergen Hill, Indiana, with a revision of the descriptions of its Fossils hitherto published, and illustrations of the species from the original type series. By R. P. Whitfield. <Vol. I. No. 3, page 39.

The following species are given as found at Boonville, and are figured:

Pentremites conoideus, Hall.

Orthis dubia, Hall.

Athyris trinucleus, Hall.

Terebratulula turgida, Hall.

AMERICAN MINERALOGICAL JOURNAL.

327

MEADE, W.—Description and Analysis of an Ore of Lead from Louisiana [Missouri]. By W. Meade, M. D. 4 pp. <Vol. I. No. 1. Jan., 1810.

AMERICAN NATURALIST.

328

ANONYMOUS.—The Geological Survey of Missouri. By T. S. H. 6 pp. <Vol. IX, page 240. April, 1875.

329

BROADHEAD, G. C.—Fossil Horse in Missouri. By G. C. Broadhead. Read before the St. Louis Academy of Science, Nov. 15, 1869. 1 p. <Vol. IV, page 60.

330

—Quaternary Deposits. By G. C. Broadhead, St. Louis, Mo. 2 pp. <Vol. IV, page 61.

331

CALL, R. E.—The Loess of North America. By R. Ellsworth Call. 13 pp, 1 pl. and 8 pp. <Vol XVI, pages 369 and 542. 1882.

332

EDITORIAL.—Notice of "On the Antiquity of Man in North America," by Dr. J. W. Foster. 2 pp. <Vol. IV, page 40.

Gives an account of the statements of Dr. Koch in regard to finding flint implements with the mastodon remains in Missouri.

333

—Lead Mines in Missouri. 1 p. <Vol. IV, page 766.

Notice of a paper read by Mr. G. C. Broadhead before the St. Louis Academy of Science in October, 1870, on "Notes on the Geology of Cole County, Missouri."

334

EDITORIAL.—Note on Haworth's papers in the *American Geologist*, on the Archæan Rocks of Missouri. 1 p. <Vol. XXII, page 732. 1888.

335

GORDON, C. H.—On the brecciated character of the St. Louis limestone. By C. H. Gordon. <Vol. XXIV, pp. 305–311. April, 1890.

This describes the character of the formation as found in Iowa, Illinois and Missouri.

336

HOY, P. R.—Dr. Koch's *Missourium*. By P. R. Hoy, M. D. 2 pp. <Vol. V, page 147.

337

NEWBERRY.—The Surface Geology of the Basin of the Great Lakes and the Valley of the Mississippi. (Copied from the *Annals of the Lyceum of Natural History of New York*, 1869.) 22 pp. <Vol. IV, page 193. 1870.

338

SPENCER, J. W.—Sand-Boulders in the Drift, or Subaqueous Origin of the Drift in Central Missouri. By Prof. J. W. Spencer. Read before the N. Y. meeting of A. A. A. S. 5 pp. 4 figs. <Vol. XXI, page 917. 1887.

339

SPENCER.—Hummocks and Boulders of Decomposition in Southeastern Missouri. 2 pp. <Vol. XXI, page 366. 1887.

340

SWALLOW, G. C.—Western coal measures and Indiana coal. By Prof. E. T. Cox. [With remarks by G. C. Swallow.] <Vol. 5, pp. 558–559.

Prof. Swallow states that he has been using Missouri coal which was fully equal to the "Block coal" of Indiana.

341

—Remarks on the geological map and section of the rocks of Missouri. By G. C. Swallow. <Vol. 5, pp. 541–542.

AMERICAN PHILOSOPHICAL SOCIETY PROCEEDINGS.

342

HARLAN.—Abstract of "Description of the Bones of a Fossil Animal of the Order Edentata, by Dr. Harlan." 3 pp. <Vol. II, page 109.

343

HAYS.—Remarks of Dr. Hays on a collection of fossil bones, chiefly of the Mastodon, brought to the city by Mr. Albert Koch, of St. Louis. 2 pp. <Vol II, page 102.

344

—Remarks of Dr. Hays on three papers recently read to the Geological Society of London, relative to the Mastodontoid animals in the collection of Mr. Koch. 3 pp. <Vol. II, page 264.

345

HORNER, W. E.—Abstract of "Note of the Remains of the Mastodon, and some other extinct animals collected together in St. Louis, Missouri; by W. E. Horner, M. D." 4 pp. <Vol. I, page 279.

346

—Abstract of "Remarks on the Dental System of the Mastodon, with an Account of some lower Jaws in Mr. Koch's collection, St. Louis, Missouri, etc., by Dr. Wm. E. Horner." 2 pp. <Vol I, page 306. 1840.

347

LESQUEREUX, L.—On the Cordaites and their related generic divisions, in the Carboniferous formation of the United States. By L. Lesquereux. 21 pp. <Vol. XVII, page 315. 1878.

The following species are described :

Cordaites communis, page 320, no fig.

C. diversifolius, page 320, Pl. XLVIII, Figs. 3, 3a. (Second Geological Survey of Pennsylvania, P. Vols. I, II and III, page 535; Plate LXXVII, Figs. 3, 3a.)

Lepidoxylon anomalum, page 334, Pl. LIV, Fig. 5; Pl. LV, Figs. 1, 1a, all from the Lower Coal Measures at Clinton.

The descriptions refer to plates and figures, but these were not published with the article.

34⁸

- WHIPPLE, S. H.—Description of Mastodon bones found in Benton County, Missouri, and presented to the society. By S. H. Whipple. 2 pp. <Vol. IV, page 35.
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AMERICAN PHILOSOPHICAL SOCIETY TRANSACTIONS.

349

- HAYS.—Remarks of Dr. Hays on Abstract of Prof. Owen's paper on the Koch Collection to the London Geological Society. 2 pp. <Vol. II, page 183. 1842.
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35⁰

- HARLAN, R.—Ichthyosaurian Remains discovered in the State of Missouri. By R. Harlan. 1831.

Also in Medical and Physical Researches, page 344. 1835. This title is a mistake. The specimens were from the Upper Missouri, and not the State of Missouri.

35¹

- HORNER, W. E.—Remarks on the Dental System of the Mastodon, with an account of some Lower Jaws in Mr. Koch's Collection, St. Louis, Missouri, where there is a solitary Tusk on the right side. By W. E. Horner, M. D., Professor of Anatomy in the University of Pennsylvania. 7 pp. <Vol. VIII, N. S., page 53.
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35²

- LEIDY, J.—Descriptions of the Remains of Fishes from the Carboniferous Limestones of Illinois and Missouri. By Joseph Leidy, M. D. 4 pp. 1 pl. <Vol. XI. N. S. Page 87. 1860.

This describes

Ctenoptychius digitatus, page 90, Pl. V, Fig. 27, from the Carboniferous Limestone near St. Louis.

BOSTON SOCIETY OF NATURAL HISTORY PROCEEDINGS.

353

- DESOR, E.—Remarks on a fine skeleton of a mastodon seen by him at Galena, Mo. By E. Desor. 1 page. <Vol. III, page 207. 1849.

354

- HARRISON, E.—Analysis of Magnetite from Iron Mountain and Pilot Knob, Missouri. By Edwin Harrison. 1 page. <Vol. VI, page 295. 1857.

355

- NEWBERRY, J. S.—Notes on the Surface Geology of the Basin of the Great Lakes. By Dr. J. S. Newberry. 5 pp. <Vol. IX, page 42.

356

- SCUDDER, S. H.—Older Fossil Insects West of the Mississippi. By Samuel H. Scudder. 3 pp. <Vol. XXII, page 58. 1882-3.

This contains a notice of a hemipterious insect from Kansas City, the first discovered in rocks older than the Tertiaries.

357

- WHITE, C. A.—Description of New Species of Fossils from the Devonian and Carboniferous Rocks of the Mississippi Valley. By Charles A. White, of Burlington, Iowa. 26 pp, 2 figs. <Vol. IX, page 8.

The following Missouri species are described:

Ambocœlia (*Spirifer* ?) *minuta*, page 26, from Hannibal.

Streptorhynchus lens, page 28, and

Chonetes geniculata, page 29, from Clarksville, all from beds equivalent to the Chemung.

358

- WHITE, C. A. & WHITFIELD, R. P.—Observations upon the Rocks of the Mississippi Valley which have been referred to the Chemung Group of New York, together with Descriptions of New Species of Fossils from the same Horizon at Burlington, Iowa. By C. A. White and R. P. Whitfield. 18 pp. <Vol. VIII, page 289.

CAMBRIDGE MUSEUM OF COMPARATIVE ZOOLOGY BULLETIN.

359

- WHITNEY, J. D. & WADSWORTH, M. E.—The Azoic System and its proposed subdivisions. By J. D. Whitney and M. E. Wadsworth. <Vol. VII, No. XI. 1884.

The crystalline rocks of Missouri are noticed on page 482.

CHICAGO ACADEMY OF SCIENCE TRANSACTIONS.

360

MCCHESNEY, J. H.—Descriptions of New Species of Fossils from the Palæozoic Rocks of the Western States. By J. H. McChesney. Extr. Trans. Chicago Acad. Sci. <Vol. I. Chicago. 1859. 96 pp.

The title page indicates that this had previously been published in the Transactions of the Chicago Academy, but such was not the case, as will be seen by the next entry. The title page states the year of publication as 1859, but the author gives it in the subsequent paper as 1860.

The following species are described:

Orthis Richmondia, page — from 12 ms. nw. of Richmond.

O. Pratteni, page — from Charbonier.

Productus Wilberanus, page 36 (Trans. 1865, page 26, Pl. I, Fig. 8), from Charbonier.

Athyris differentis, page —, from Charbonier and Richmond.

Edmondia concentrica, page 55 (*Astartella concentrica*, Trans. 1865, page 43, Pl. II, Fig. 21), from Charbonier.

Myalina Swallowi, page 57 (Trans. 1865, page 41, Pl. II, Figs. 6a, b, from Charbonier and 12 ms. nw. of Richmond.

Discina capuliforma, page 72 (*D. capuliformis*, Trans. 1865, page 23, Pl. II, Fig. 20), from 12 ms. nw. of Richmond, all from the Coal Measures.

Actinocrinus tenuisculptus, page 15 (Trans. 1865, page 11, Pl. V, Fig. 1), from the Burlington at Columbia.

Athyris ultravarica, page —, from the Keokuk at Ste. Genevieve.

361

—Descriptions of Fossils from the Palæozoic Rocks of the Western States, with Illustrations. By J. H. McChesney, Professor of Geology and Mineralogy in the University of Chicago. 57 pp. 9 plates. <Vol. I, page 1. 1867-9.

See remarks under preceding number. Part of the species of that pamphlet are described again and figured as stated in the preceding number.

Hemipronites crassus, M. & H. is figured from the Coal Measures at Richmond, and *Edmondia concentrica* is changed to the genus *Astartella*.

CINCINNATI SOCIETY OF NATURAL HISTORY JOURNAL.

362

MILLER, S. A.—Descriptions of two new Species from the Niagara Group, and five from the Keokuk Group. By S. A. Miller, Esq., 6 pp. 1 pl. <Vol. II, page 254.

Describes the following species:

Platycrinus Bloomfieldensis, page 257.

Codaster graciosus, page 257.

Strotocrinus Bloomfieldensis, page 258, Pl. XV, Figs. 6, 6a, all from the cherty beds of the Keokuk at New Bloomfield.

363

—Descriptions of some new and remarkable crinoids and other fossils of the Hudson River Group, and notice of *Strotocrinus Bloomfieldensis*. 9 pp. 1 pl. <Vol. IV, page 69.

This has additional description and figure of *Strotocrinus Bloomfieldensis*, page 76, Pl. I, Fig. 6.

364

—*Glyptocrinus* redefined and restricted, *Gaurocrinus*, *Pycnocrinus* and *Compsoocrinus* established, and two new species described. <Vol. VI, page 217.

This describes:

Gaurocrinus splendens, page 230, from the Trenton Group (?) at Cape Girardeau.

365

MILLER, S. A. and GURLEY, WM. F. E.—Description of some new genera and species of Echinodermata from the Coal Measures and Subcarboniferous Rocks of Indiana, Missouri and Iowa. By S. A. Miller and Wm. F. E. Gurley. 59 pp., 10 plates. <Vol. XIII, page 3. April, 1890.

The following Missouri species are described:

Eupachycrinus spherialis, page 5, Pl. I, Figs. 3, 4.

Ulocrinus Brittsi, page 7, Pl. I, Figs. 5, 6.

U. Kansasensis, page 8, Pl. I, Figs. 7, 8, 9, 10.

Delocrinus Missouriensis, page 14, Pl. II, Figs. 8, 12, 13.

Æsiocrinus magnificus, page 15, Pl. II, Figs. 1, 2, 3, 4, 5.

Æ. Harrii, page 16, Pl. III, Fig. 1.

Æ. basiliscus, page 53, Pl. IX, Figs. 4, 5, 6, all from the Upper Coal Measures at Kansas City.

Delocrinus hemisphericus, Shumard, from Kansas City, is figured on Pl. II, Figs. 8, 9, 10.

The following new descriptions are given :

Family *Eupachyrcrinidae*, page 3.

Genus *Ulocrinus*, page 6.

" *Delocrinus*, page 9.

" *Æsiocrinus*, page 14.

The above abstract is of the entire paper as published in pamphlet form. The Journal at the date given contained only the first 25 pages and 4 plates.

366

ULRICH, E. O.—American Palæozoic Bryozoa. By E. O. Ulrich. <Vol. VII, page 24. 1884.

Rhombopora crassa, page 28, Pl. I, Figs. 2, 2a, 2b.

Fistulipora carbonaria, page 45, Pl. III, Figs. 1, 1a, both from the Upper Coal Measures at Kansas City.

DENISON UNIVERSITY, BULLETINS OF THE SCIENTIFIC LABORATORIES.

367

HERRICK, C. L.—A sketch of the Geological History of Licking County accompanying an Illustrated Catalogue of Carboniferous Fossils from Flint Ridge, Ohio. Appendix I. Carboniferous Trilobites. Appendix II. A Waverly Trilobite. By C. L. Herrick. <Vol. II, Part I, pp. 5-70.

Descriptions are given of several species of trilobites which were described from Missouri types, and the name *Proetus Missouriensis*, Shum., is changed to *Phillipsia Shumardi*, page 58, and page 69, Plate VII, Fig. 14.

GEOLOGICAL MAGAZINE.

368

EDITORIAL.—Review of Reports of the Geological Survey of the State of Missouri, 1855-1871, by Broadhead, &c. 2 pp. <Vol. I n. s. page 368. 1874.

369

—Review of the Mississippi Valley; its Physical Geography, &c., by J. W. Foster, Chicago, 1869. 3 pp. <Vol. VI, page 421. 1869.

GEOLOGICAL SOCIETY OF PENNSYLVANIA TRANSACTIONS

37⁰

HARLAN, R.—Critical Notices of Various Organic Remains hitherto discovered in North America. By Richard Harlan, M. D. 47 pp. <Vol. I, Part 1, pages 46-112. 1834.

Contains description of *Bos Pallasii*, De Kay, from New Madrid.

37¹

TROOST, G.—On the organic remains which characterize the transition series of the valley of the Mississippi, &c. By G. Troost, M. D. In a letter to Dr. Harlan, of Philadelphia. 3 pp. <Vol. I, Part II, pages 248-250. 1835.

This gives a list of 49 species of fossils found in the "transition strata, including the mountain limestone of the English geologists." The author gives some other names in addition to the numbered list, and states that there are many other fossils, but that he had not yet determined them.

HUNT'S MERCHANTS' MAGAZINE.

37²

DILLE, I.—Mineral Resources of Southern Missouri. Israel Dille of Ohio. 6 pp. <Vol. XIII, No. 3. April, 1845.

373

—Mineral Region and Resources of Missouri. 7 pp. <Vol. XV, No. 1, page 28. July, 1846.

374

FEUCHTWANGER, L.—Mineral Resources of Missouri. Mineralogical Observations in the State of Missouri, made by Dr. Lewis Feuchtwanger. Read before the New York Lyceum of Natural History. 5 pp. <Vol. XVI. No. 2, page 177. Feb., 1857.

375

LAMBORN, R. H.—Missouri Iron Region. By Robert H. Lamborn, Esq., of St. Louis. 7 pp. <Vol. 53, page 329. Nov., 1865.

376

WHITTELSEY, C. C.—Missouri and its Resources. [C. C. Whittelsey, of Missouri.] 10 pp. <Vol. VIII, page 535. June, 1843.

KANSAS ACADEMY OF SCIENCE TRANSACTIONS.

377

HAWORTH, E.—The Coal Fields of Cherokee County, Kansas. By Erasmus Haworth, B. S., Empire City, Kansas. 5 pp. <Vol. VIII, page 7, 1881-2.

This has notes on the geology of the adjoining parts of Missouri.

KANSAS CITY REVIEW OF SCIENCE AND INDUSTRY.

378

ANONYMOUS.—The Mineral Resources of Missouri. <Vol. I, pp. 144-147.

379

— Analysis of Sweet Springs Water, Saline County, Mo. <Vol. I, page 186.

380

— A Fourth Oil Rock. <Vol. I, page 491.

Notices an oil-bearing sand at 1645 feet, at Big Shanty, south of Bradford, Missouri.

381

— Missouri Mineral Production. From the Engineering and Mining Journal. 3 pp. <Vol. II, No. 2, pp. 104-106. May, 1878.

382

— Ancient Man in Missouri. (From the Scientific American.) 2 pp. <Vol. IV, No. 6, pp. —. Oct., 1880.

383

- BALLARD, F. A.—Mastodon Remains found in Jackson County, Mo.
By Dr. F. A. Ballard, Independence, Mo. 2 pp., 1 Ill. <Vol. III,
No. 11, page 643. March, 1880.

384

- BAUCHER, W.—[Stump of Oak five feet deep in prairie soil, Oregon
Mo. By W. Baucher.] <Vol. I, page 509.

385

- BROADHEAD, G. C.—Thickness of the Missouri Coal Measures. By
Prof. G. C. Broadhead. 2 pp. <Vol. I, No. 7, pages 392–393,
Sept., 1877.

386

- Missouri Iron Ores of Carboniferous Age. <Vol. I, page 650.

387

- Mineralogy. Bitumen, Asphaltum, Petroleum, Pyroschists, and
certain other solid Hydro-carbons. (Read before the Kansas City
Academy of Science, November 28, 1876.) <Vol. I, No. 4, pages
209–224. June, 1877.

This contains an account of oil and bitumen in Western Missouri.

388

- Meteoric Stones and Shooting Stars. 19 pp. <Vol. I, No. 12,
pages —. Feb., 1878.

This notices the different Missouri meteorites.

389

- Jackson County, Missouri—A few notes on its Geology. 7 pp.
<Vol. II, No. 4, pages 204–210. July, 1878.

390

- Notes on Surface Geology of Southwest Missouri and Southeast
Kansas. 2 pp. <Vol. III, No. 8, pp. 460–461. Dec., 1879.

391

- Review of Contributions to Palæontology. Nos. 2–8. By C. A.
White, M. D. 2 pp. <Vol. IV, No. 7, pp. 448–449. Nov., 1880.

Several of the Missouri fossils described by Dr. White in these Contributions were sent to him by Prof. Broadhead, who here adds some facts in regard to them and their geology.

392

BROADHEAD, G. C.—The Mastodon. <Vol. IV, No. 9, pp. 519-530. Jan., 1881.

An account is given of the Mastodons found near Sedalia by Mr. R. A. Blair.

393

— The Marbles of Southeast Missouri. 4 pp. <Vol. V, No. 9, page 523. Jan., 1882.

394

— Archæan Rocks of Missouri. <Vol. V, No. 12, page 733. 1882

395

BROADHEAD.—Old maps. 3 pp. <Vol. VII, No. 1, pp. 56-58. May, 1883.

This gives an account of the old geological and other maps of the State.

396

— Flint Chips. 3 pp. <Vol. VII, pp. 599-602.

An account is given of the different chert-beds of Missouri.

397

— Explorers of Western America. 6 pp. <Vol. VII, No. 7, pp. 407-412. Nov., 1883.

The reports of the different explorers who traveled in Missouri are noticed.

398

— Mines of Carterville, Jasper Co., Missouri. 3 pp. <Vol. VIII, Nos. 2-3, pp. 70-72. June-July, 1884.

399

CASE, T. S.—The Mineral Region of Southwest Missouri and Southeast Kansas. By the Editor. [Theo. S. Case.] 7 pp., 2 wood cuts. <Vol. I, No. 7, page 385. Sept., 1877.

400

CASE.—Missouri Copper Mines. [Editorial.] 3 pp. <Vol. VI., No. 5, page 304. Sept., 1882.

401

CASE.—Geological Surveys of Kansas and Missouri. 4 pp. <Vol. VI, Nos. 9-10, pp. 592-5. 1880.

402

- CASE.—Notice of "Geology and Mineralogy of Cherokee County, Kansas, by Erasmus Haworth, B. S." 1 p. <Vol. VIII, Nos. 2-3, page 146. June-July, 1884.

403

- CLERC, F. A.—The Lead and Zinc Region of Missouri and Kansas. F. A. Clerc. (From the Mineral Resources of the U. S.) 6 pp. <Vol. VII, No. 6, page 330. Oct., 1883.

404

- EMERY, J. B.—Description of Marble Cave, Missouri. (Stone County.) Capt. J. B. Emery, 9 pp. <Vol. VIII, No. 11, page 614. March, 1885.

405

- GAGE, J. R.—The Ste. Genevieve County Copper Mines. By J. R. Gage. <Vol. I, pp. 603-605.

406

- HAWORTH, E.—The Chert Rocks of Sub-carboniferous Kansas. By Erasmus Haworth, B. S. <Vol. V, No. 11, pp. 669-676. March, 1882.

This describes the formation in which the lead and zinc of Southwest Missouri are found.

407

- LEWIS, J. L.—Fossil Remains in Southwest Missouri. J. L. Lewis, Bolivar, Missouri. 1 page. <Vol. IV, No. 4, page 207. Aug., 1880.

408

- LYKINS, W. H. R.—Kansas City Fossils. W. H. R. L[ykins.] 1 page. <Vol. VII, No. 2, page 113. June, 1883.

409

- LYKINS, W. H. R.—List of Fossils in Kansas City and Vicinity. 5 pp. <Vol. VIII, Nos. 2-3, page 72. June-July, 1884.

410

- PHILLIPS, J. V. C.—Geology of the West. By J. V. C. Phillips. <Vol. I, pp. 488-491.

Describes the section of the St. Louis Insane Asylum well.

411

SPENCER, J. W.—The Ancient Mississippi and its Tributaries. J. W. Spencer, Professor of Geology in the State University of Missouri. 7 pp. <Vol. VI, No. 11, pp. —.

412

TROWBRIDGE, S. A.—Geological Survey of Missouri. Prof. S. H. Trowbridge. 6 pp. <Vol. VI, No. 11, page —.

413

WEST, E. P.—Human Remains in the Loess of the Missouri River. E. P. West. 4 pp. <Vol. VI, No. 8, page —. Dec., 1882.

414

— Age of the Missouri River. 4 pp. <Vol. VII, No. 1, page 25–28. May, 1883.

LYCEUM OF NATURAL HISTORY OF NEW YORK ANNALS.

415

DEKAY, J. E.—Notes on a fossil skull in the Cabinet of the Lyceum, of the Genus *Bos*, from the banks of the Mississippi; with observations on the American species of that Genus. By J. E. DeKay. 12 pp. <Vol. II, page 280.

Describes the following:

Bos Pallassii, page 280, Pl. C, from New Madrid.

416

NEWBERRY, J. S.—On the Surface Geology of the Basin of the Great Lakes, and the Valley of the Mississippi. By J. S. Newberry. 22 pp. <Vol. IX, page 213.

THE MINING MAGAZINE OF WM. J. TENNEY, New York.

“MINING AND STATISTICAL MAGAZINE,” Thomas McGrath; and “MINING MAGAZINE AND JOURNAL OF GEOLOGY,” T. P. Blake.

The two latter magazines were successors to the first.

417

ANONYMOUS.—Manufacture of Iron at St. Louis. (Communication to St. Louis Republican.) <Feb. 1860, pp. 312–313.

The cost of production of iron at Iron Mountain and Pilot Knob is given.

418

BAILEY.—Iron Manufacture in Missouri. (Copied from Western Journal.) <Vol. II, No. 5, May, 1854. pp. 581-583.

419

EDITORIAL.—Missouri Coal. 2 pp. <Vol. III, No. II, Aug., 1854, page 216.

420

— Lead Mining in Missouri. 2 pp. <Vol. III, No. IV, Oct., 1854, page 440.

421

— Geological Survey of Missouri. <Dec., 1859, p. 159.
Notice of and quotation from Swallow's Fourth Report.

422

— Reported Discovery of Gold Mines in Missouri. <Vol. I, Second Series, pp. 406-407. March, 1860.

Notice of mines then reported found in Madison County, which, according to Koch, produced ore worth over \$100,000 per ton.

423

JAMISON, J.—Coal Fields and Coal Mines on the Western Waters. J. Jamison in Report of Chief of Bureau of Construction to the Secretary of the Navy. <Vol. I, No. 6, page 654. Dec., 1853.

424

ST. LOUIS REPUBLICAN.—Missouri Lead Mines. By Editor of St. Louis Republican. 2 pp. <Vol. I. No. V, page 525. Nov., 1853.

425

— Iron Mountain and Pilot Knob, Missouri. (Copied from St. Louis Republican.) 2 pp. <Vol. II. No. IV, page 453. April, 1854.

426

WESTERN JOURNAL.—Iron and Zinc. Iron Mountain Region, Mo. 3 pp. (Copied from Western Journal.) <Vol. V. No. 1, July, 1855.

427

WHITNEY, J. D.—The Lead Deposits of the Mississippi Valley. By J. D. Whitney. <Dec. 1859, pp. 89–102; Jan. 1860, pp. 169–184; Feb. 1860, pp. 287–299.

Extracted from the Geological Survey of Iowa, Vol. I. A few references to Missouri, but mostly Iowa and other northern places.

MINES, METALS AND ARTS, OF ST. LOUIS, J. E. WARE, EDITOR.

428

The following list of articles from the above publication has been furnished by Prof. Broadhead: (*)

1874.

May 7—Simpson's Coal and Lead Mines. Editorial.

May 14—How is the interest in Missouri Iron property to be restored? Editorial.

do. P. H. Schneider's Granite Quarries.

May 28—School of Mines.—Granby Mines. Editorial.

do. Missouri Minerals. Simpson Mines, etc. Editorial.

July 2—Fire Clay. "By Musquito."—D. A. Bauman.

July 9—Developing Lead and Zinc. "Musquito."

do Fire Brick. Edit.

July 23—Mines and furnaces S. E. Mo.—Mo. Lead for 1874.—Missouri ores.

Edit.—Joplin and its Mines. Speech by J. V. Wheelhouse.

July 30—Missouri Mines.

Aug. 13—St. Jo Mines. Edit.

Aug. 20—Several items Missouri mines. Edit.

Missouri Zinc, D. Bauman. Chouteau League Tract Mines, do.

Aug. 27—Dade county Zinc. Edit.

Sept. 3—Old Mines Conception. D. Bauman.

Sept. 10—Higginbotham Lead Mines. D. Bauman.

Sept. 17—S. W. Mo. Lead and Zinc.—St. Joe & Valle Mines. Edit.

Sept. 24—Shibboleth Mines.—Washington Co. coal. D. Bauman.

Lincoln county coal Edit.

Oct. 8—Sandstone quarries—Zinc—Lead—Fire brick. Edit.

Oct. 15—Palmer Lead Mines. D. Bauman.

Oct. 22—Lead Mining Jasper Co.—Joplin Mines. Edit.

Nov. 5—S. E. Mo. Lead Mines. D. Bauman.

Nov. 5, 12, 19, 26, Dec. 3, 10, 24, 31—State Geological Reports. Edit.

Dec. 12—S. W. and S. E. Mo. Mines.

Dec. 19—Missouri Mines. Edit.

Dec. 26—Dade county Mines. D. Bauman.

do. Missouri Ores and Mines. Edit.

- Dec. 3—Missouri Mines.
 Dec. 10—Missouri Mining Interests.—Mo. Geol. Survey. Edit.
 Dec. 17—Jasper county Mining Items. Edit.
 Dec. 24—S. E. and S. W. Mo. Mines.
 do. Iron and Copper in Missouri. R. S. Elliott.

1875.

- Jan. 7, 21, Feb. 11—Geological Survey and Reports. Edit.
 Jan. 14—Dade county Mines.
 Jan. 21—Central Missouri Lead Mines—Linn Creek Mines.
 do. Mining Regions, S. W. Mo. W. S. Guy.
 Feb. 18—Joplin, etc., Lead Statistics. Edit.
 Feb. 25—Lead in Christian county.
 March 25—Missouri Mining Items.
 April 1—S. W. Mines and Furnaces—Iron Ores. Edit.
 April 8—Iron interests and Lead. Edit.
 April 27—Pettis and Polaski counties mines. Correspondence. Mines and
 furnaces in Missouri. Edit.
 May 6—Johnson county Iron Ore.
 May 27—Mine La Motte. Mining Industries in Missouri.
 June 3—Mines S. E. Mo. Edit.
 June 24—Missouri Mines.
 July 15—Iron Ores of Missouri. J. L. Bell.
 Aug. 19—Mines S. W. and S. E. Mo. Edit.
 Sept. 9—Washington county Mines, Webbville.
 Sept. 16—Mo. Lead Mines—Discoveries of Lead in Missouri and Mine La
 Motte.—Washington Co. Mines.—Cartersville Mines.
 Sept. 23—Ste. Genevieve Copper Mines.—Missouri Lead Mines.
 Oct. 7—Missouri Gold. J. T. Reiston.
 Oct. 21—S. W. Mo. mines.
 Nov. 4—Granby Mines.
 Nov. 25—Missouri Gold. C. F. Williams and Edit.
 Dec. 16—Desloge Mines, Southeast Missouri.

1876.

- Jan. 6—Iron Mountain and Irondale furnaces. Missouri Gold Field.
 March 2—Zinc production in Missouri. Lead in S. W. Missouri. Annual
 production of lead in Mo. E. A. Casswell and Ed.
 April 13—Lead in Missouri. Ed. Dunscomb.
 June 1—S. W. Mo. Mines.
 June 22—Desloge Mines.
 June 29—Dade county mines.
 Aug. 10—Missouri Mines. Cantwell.
 Sept. 7—Joplin and Granby.
 Oct. 19—S. E. Mo. mines.

1877.

- Jan. 25—Lead discoveries at Granby. Production of lead.
 June 14—S. E. Mo. Mines.
 July 12—Missouri mines.
 Oct. 15—Missouri mines.
 Nov. 11—Ste. Genevieve Mines. J. R. Gage.
 Dec. 20—Lead interest in Missouri.

1878.

Jan. 10—Production of mines.

Also the following papers by Prof. Broadhead:

Physical Geography Mississippi Valley. Feb., 1876.

Iron Ores Carboniferous Age. Feb. 25, 1875.

Geological Notes S. E. Mo. Reynolds Co. March, 1876.

Area and Topographic features S. W. coal field. 1874.

Morgan Co. Lead Mines. Sept. 2, 1875.

Meteoric Iron in Mo. Sept. 19, 1875.

Meteoric Iron, referring to Dr. Shumard's notes. Oct. 14, 1875.

St. Joe Mines, S. E. Mo. Oct. 21, 1875.

Visit to S. E. Mo. Mines. Oct. 28, 1875.

Drift formation and Gold in Mo. Dec. 9, 1875.

Mines of Morgan and Benton Co. July 29, 1875.

Mines of Cole Co., Mo. Aug. 12, 1875.

Coal S. W. Mo. Dec. 20, 1877.

Bituminous shales. Feb. 15, 1877.

NEW YORK ACADEMY OF SCIENCE—ANNALS.

429

VOGDEN, A. W.—The Genera and Species of North American Carboniferous Trilobites. By Anthony W. Vogdes. <Vol. IV, pp. 69-105. Feb., 1888.

The Carboniferous formations of Missouri are noticed. Descriptions and notices of the following species from the State are given:

Proetus Missouriensis, Shumard, page 75, Pl. III, Fig. 1, from the Lithographic Limestone (Waverly series) at Hannibal, Louisiana and Chouteau Springs.

Phillipsia major, Shumard, page 85, Plate III, Fig. 14, from the Upper Coal Measures, Clinton County and Kansas City.

P. Missouriensis, Shumard, page 86, Pl. III, Figs. 1-2, from the Middle Coal Measures, Lexington.

P. Meramecensis, Shumard, page 86, Pl. III, Fig. 15, from the Archimedes limestone [Chester series], Fenton, St. Louis county.

NEW YORK ACADEMY OF SCIENCE TRANSACTIONS.

430

SAMPSON, F. A.—Notes on the Subcarboniferous Series at Sedalia, Missouri. By F. A. Sampson. 2 pp. <Vol. VII, page 246. 1888.

43¹

VOGDEN, A. W.—Description of two new Species of Carboniferous Trilobites. By A. W. Vogdes. 4 pp. <Vol. VII, page 247. 1888

This describes the following species:

Phillipsia Sampsoni, page 24, figure, from the Waverly Series (Chouteau Limestone).

Griffithides (?) *Sedaliensis*, page 24, from the Waverly Series (Chouteau Limestone), both at Sedalia.

NORTH AMERICAN REVIEW.

43²

EDITORIAL.—Missouri. Review of "Gazetteer of the State of Missouri, by Alphonso Wetmore, St. Louis, 8vo., 1837." 13 pp. <No. CIII, page 514. April, 1839.

433

— The Missouri Valley and the Great Plains. 29 pp. No. CLXXX, page 66. July, 1858.

PHILADELPHIA ACADEMY NATURAL SCIENCE JOURNAL

434

LEIDY, J.—Descriptions of some remains of Fishes from the Carboniferous and Devonian Formations of the United States. B. Joseph Leidy, M. D. 7 pp. 3 plates. <Vol. III, Second Series page 159. 1854.

The following Missouri species is described:

Oracanthus vetustus, page 1. Plate — from Missouri Territory, exact place not known.

435

NORWOOD, J. C., & PRATTEN, H.—Notice of Producti found in the Western States and Territories, with descriptions of twelve new species. By J. C. Norwood and Henry Pratten of the Illinois Geological Survey. 18 pp. 2 plates. <Vol. III, Second series, page 5. Aug. 1854.

The following are described :

Productus Rogersii, page 9, Pl. I, Fig. 3, *a, b, c*, Huntsville.

P. splendens, page 11, Pl. I, Fig. 5, *a, b, c, d*, 6 miles west of Richmond.

P. muricatus, page 14, Pl. I, Fig. 8, *a, b, c, d, e*, 6 ms. nw. of Richmond.

P. Portlockianus, page 15, Pl. I, Fig. 9, *a, b, c*, Charboniere.

P. Prattenianus, page 17, Pl. I, Fig. 10, *a, b, c, d*, 85 ms. nw. of St. Joseph.

P. Hildrethianus, page 18, Pl. I, Fig. 11, *a, b, c*, Charboniere, all from the Coal Measures.

P. elegans, page 13, Pl. I, Fig 7, *a, b, c*, from the Mountain Limestone near Hat Island.

Missouri localities of various other species are also given.

436

— Notice of the genus *Chonetes*, as found in the Western States and Territories, with descriptions of eleven new species. 8 pp. 1 plate. <Vol. III, page 23, Second series. 1854.

Describes the following species :

Chonetes Flemingii, page 26, Pl. II, Fig. 5, *a, b, c, d, e*, from 10 ms. nw. of Richmond.

C. Verneuiliana, page 26, Pl. II, Fig. 6 *a, b, c*, and

C. mesoloba, page 27, Pl. II, Fig. 7, *a, b, c*, from the Coal Measures at Charboniere.

Missouri localities are also given of other species.

437

— Notice of Fossils from the Carboniferous Series of the Western States, belonging to the genera *Spirifer*, *Bellerophon*, *Pleurotomaria*, *Macrocheilus*, *Natica* and *Loxonema*, with descriptions of eight new characteristic species. 7 pp. 1 plate. <Vol. III, page 71, Second series. 1854.

This describes :

Spirifer spinosus, page 71, Pl. IX, Fig. 1, *a, b, c, d*, from the Mountain Limestone of Missouri opposite Hat Island.

438

NUTTALL, T.—Observations on the Geological Structure of the Valley of the Mississippi. By Thomas Nuttall, read December, 1820. <Vol. II, Part I, pp. 14–52, 1821.

PHILADELPHIA ACADEMY NATURAL SCIENCE PROCEEDINGS.

439

FRAZER, P.—[Remarks on Pilot Knob, Iron Mountain and Mine La Motte Districts.] By Prof. Persifor Frazer, Jr. 2 pp. <1874, Part II, page 85.

440

GODDARD, P. B.—Remarks on *Missourium Kochii*. By Dr. Paul B. Goddard. 2 pp. <Vol. I, page 115. 1841.

441

KOENIG, G. A.—Mineralogical Notes. By Dr. G. A. Koenig. <1876, page 156.

Gives analysis of earthy barite from St. Louis.

442

LEEDS.—Remarks concerning a great elevation of temperature in an adit level of a lead mine in Missouri, by Prof. Leeds. 2 pp. <1874, Part II, page 145.

443

MEEK, F. B. & WORTHEN, A. H.—Descriptions of New Palæozoic Fossils from Illinois and Iowa. By F. B. Meek and A. H. Worthen. 21 pp. <1861, page 128.

Describes from Missouri:

Productus magnus, page 142, no fig. (Illinois Survey, Vol. III, page 528, Pl. 20, Figs. 7a, b, c), Keokuk Limestone, Ste. Genevieve county.

444

— Descriptions of New Species of Crinoidea, &c, from the Palæozoic rocks of Illinois and some of the adjoining States. 13 pp. <1865, No. 3, page 143.

Describes the following:

Comarocystites Shumardi, page 143, no fig. (Illinois Survey, Vol. III, page 292, Pl. I, Fig. 1a, b).

C. Shumardi var *obconicus*, page 144, no fig. (Illinois Survey, Vol. III, page 294, Pl. I, Figs. 2a, b), both from the Trenton Limestone at Cape Girardeau.

445

- MEEK, F. B. and WORTHEN, A. H.—Descriptions of New Crinoidea, &c., from the Carboniferous Rocks of Illinois and some of the adjoining States. By F. B. Meek and A. H. Worthen. 12 pp. <1865. No. 3, page 155.

Describes the following:

Evactinopora radiata, page 165 (Illinois Survey, Vol. III, page 502, Fig. also Pl. 17, Figs. 2a, b), from the Subcarboniferous of Missouri.

446

- Contributions to the Palæontology of Illinois and other Western States. 29 pp. <1865. No. 5, page 245.

Describes the following:

Nautilus (Cryptoceras) capax, page 262, from the Coal Measures at Charboniere.

447

- Contributions to the Palæontology of Illinois and other Western States. 25 pp. <1866. Page 251.

Describes the following:

Macrodon micronema, page 261.

Platyceras lævigatum, page 263.

Naticopsis Littonana, var *Genevievensis*, page 268.

Trochita (?) carbonaria, page 270, all from the Chester in Ste Genevieve Co.

Missouri localities are also given of other species.

448

- MEEK.—Observations on the Microscopic Shell Structure of *Spirifer cuspidatus*, Sowerby, and some similar American forms. 3 pp. <1865, No. 5, page 275.

Various forms from Missouri are considered.

449

- MEEK, F. B.—Descriptions of New Species of Fossils from Ohio and Western States and Territories, by F. B. Meek. <1871, page 159.

Describes the following:

Aviculopecten ? Williamsi, page 178, from Chouteau Limestone at Chouteau Springs.

450

- Notice of a New Brachiopod from the Lead-bearing Rocks at Mine La Motte, Missouri. 3 pp. <1871, page 185.

Describes:

Lingulella Lamborni, page 185, Figs. 1-4.

45¹

OWEN, D. D.—Remarks on Stone Slabs containing supposed imprints of human feet, by Dr. D. D. Owen. 1 page. <Vol. VI, page 106. 1852.

45²

ROMINGER, C.—Observations on *Chaetetes* and some related Genera, in regard to their systematic Position; with an appended description of some New Species. By Dr. Carl Rominger. 11 pp. <1866. page 113.

Describes the following :

Callopora Missouriensis, page 117, locality and position not given.

Fistulipora trifolia, page 122.

F. compressa, page 123.

F. peculiaris, page 123, all from the Keokuk Limestone at LaGrange.

453

WINCHELL, A.—Descriptions of New Species of Fossils, from the Marshall Group of Michigan, and its supposed equivalent, in other States; with Notes on some Fossils of the same age previously described. By Professor Alexander Winchell. 25 pp. <1865. No. 3, page 109.

Describes the following :

Conopoterium effusum, page 111.

Zaphrentis Ida, page 111.

Spiriferina Clarksvillensis, page 119, all from Clarksville.

Spirigera Missouriensis, page 117, from Louisiana, all from the Lithographic Limestone.

Missouri localities are also given of various other species.

ST. LOUIS ACADEMY OF SCIENCE TRANSACTIONS.

454

BROADHEAD, G. C.—Fossil Horse in Missouri. By G. C. Broadhead, 2 pp. <Vol III, page xx, Oct. 4, 1869.

455

— Bones of Large Mammals in Drift. 2 pp. <Vol. III, page xxii, Nov. 15, 1869.

Accounts of fossil remains from various parts of Missouri are given.

456

- BROADHEAD, G. C.—Mineralogy of Cole County, Missouri. 2 pp.
<Vol. III, page xxxiii, Nov. 21, 1870.

457

- Coal Measures in Missouri. By G. C. Broadhead. 23 pp. <Vol.
II, page 311.

458

- Missouri Geological Surveys. Historical Memoir. By G. C.
Broadhead. 14 pp. <Vol. IV, page 611.

459

- Occurrence of Bitumen in Missouri. By G. C. Broadhead. 3 pp.
<Vol. III, page 224.

460

- On the Well at the Insane Asylum, St. Louis County. By G. C.,
Broadhead. 8 pp. 1 pl. <Vol. III, page 216.

461

- Age of our Porphyries. By G. C. Broadhead. 5 pp. <Vol. III,
page 366. Also supplemental note in Vol. III, page ccix, June 19,
1876. 1 page.

462

- Carboniferous Rocks of Eastern Kansas. By G. C. Broadhead
12 pp. <Vol. —, page 481.

This shows the correspondence between the formations of eastern Kansas
and western Missouri.

463

- ENGELMANN, G.—Elevation of St. Louis above the Gulf of Mexico.
By George Engelman, M. D. 5 pp. <Vol. I, page 663.

464

- The Variations of the Stage of the Mississippi River at St. Louis.
By George Engelmann, M. D. <Vol. II, page 420.

465

- GAGE, J. R.—On the Occurrence of Iron Ores in Missouri. By Jas.
R. Gage, M. E., Assistant State Geologist of Missouri. 12 pp.
<Vol. III, page 181.

466

HAMBACH, G.—Description of new Palæozoic Echinodermata. By G. Hambach. 7 pp. 2 plates. <Vol. IV, page 548 1884.

Describes the following Missouri species :

Melonites crassus, page 548, Pl. C., Fig. 1.

M. irregularis, page 549, Pl. C., Fig. 2.

Oligoporus parvus, page 550, Pl. C., Fig. 3.

Archæocidarus Newberryi, page 551, Pl. D., Fig. 1, all from the St. Louis Limestone at St. Louis.

Pentremites Sampsoni, page 551, Pl. D., Fig. 2, 2a, from the Chouteau Limestone of Pettis County.

Codonites campanulatus, page 553, Pl. D., Figs. 8, 9, from the Burlington Limestone at Sedalia.

467

HARRISON, E.—Age of the Porphyry Hills of Southeast Missouri. By Edwin Harrison, B. S. 1 page, 1 fig. <Vol. II, page 504.

468

HOLMES.—Remarks by Mr. Holmes upon the Loess and Drift in connection with the Big Mound at St. Louis. 5 pp. <Vol. II, page 565.

469

— Remarks on Col. Forshey's "Delta of the Mississippi." 2 pp. <Vol. III, page cxiv.

470

HOLMES.—Man and the Elephant in Nebraska. Remarks by Judge Holmes. 2 pp. <Vol. III, page cxxiii. May 15, 1876.

Refers to the accounts by Dr. Koch of man and the mastodon in Benton and Gasconade counties.

471

KOCH, A. C.—Mastodon Remains in the State of Missouri, together with Evidences of the existence of Man contemporaneously [sic] with the Mastodon. By Dr. Albert C. Koch. 4 pp. <Vol. I, page 61.

472

LEONHARD, A. V.—On the Occurrence of Millerite in St. Louis. By A. V. Leonhard. 3 pp., 2 plates. <Vol. IV, page 493.

473

— Notes on the Mineralogy of Missouri. 13 pp. <Vol. IV, page 440.

474

- LITTON, A.—Belcher & Brother's Artesian Well. By A. Litton, M. D.
7 pp., 1 plate. <Vol. I, page 80.

475

- McGEE, W. J.—Notes on the Geology of Macon County, Missouri.
By W. J. McGee, U. S. Geologist. 32 pp., 2 maps, 4 figs. <Vol.
V, page 305.

476

- PROUT, H. A.—First of a Series of Descriptions of Carboniferous
Bryozoa. By H. A. Prout, M. D. 3 pp., plates. <Vol. I, page
235. 1858.

Describes from Missouri :

Fenestralia St. Ludovici, page 235, Pl. 15, Figs 1, 1a, from the Upper layers of the
St. Louis Limestone at St. Louis.

477

- Third Series of Descriptions of Bryozoa from the Palæozoic Rocks
of the Western States and Territories. 10 pp., 4 plates. <Vol. I,
page 443. 1859.

Describes the following :

Fenestella hemitrypa, page 444, Pl. 17, Figs. 3, 3a, b, c, d.

Flustra spatulata, page 446, Pl. 17, Figs. 2, 2a, 2b, 2c.

F. tuberculata, page 447, Pl. 17, Figs. 3, 3a, b, c, d.

Fenestella Banyana, page 450, Pl. 18, Figs. 4, 4a, 4b. All from the Second
Archimedes Limestone at Barrett Station, St. Louis County.

478

- Fourth Series of Descriptions of Bryozoa from the Palæozoic
Rocks of the Western States and Territories. 11 pp. <Vol. I,
page 571. 1860.

Describes the following :

Coscinium plumosum, page 572 (Illinois Survey, Vol. II, page 414, Pl. 22, Figs.
3, 3a, from the St. Louis Group, Barrett's Station), from the Second Archi-
medes Limestone at Barrett's Station.

Cyclopora fungia, page 577, (Illinois Survey, Vol. II, page 419, Pl. 22, Figs. 9,
9a, 9b), from the Keokuk Limestone at St. Francisville.

479

- Description of a new Species of *Productus*, from the Carbonifer-
ous Limestone of St. Louis. 3 pp., 1 pl. <Vol I, page 43. 1857.

Describes the following :

Productus marginicinctus, page 43, Pl. 2, Figs. 1-17, from the Upper Carbonifer-
ous in the suburbs of St. Louis.

480

SAWYER, A.—On the Origin of Ravines in the Prairies. By Amos Sawyer. 1 page. <Vol. III, page cxlix, November 2, 1874.

The results of observations on the prairies at Hillsboro are given.

481

SCHMIDT, A.—On the Forms and Origin of the Lead and Zinc Deposits of Southwest Missouri. By Adolf Schmidt, Ph. D. 7 pp. <Vol. III, page 246.

482

— Iron Manufacture in Missouri. A General Review of the Metallurgical Districts and their Resources. 12 pp. <Vol. III, page 261.

483

SHUMARD, B. F.—A Catalogue of the Palæozoic Fossils of North America. By B. F. Shumard, M. D. 74 pp. <Vol. II, page 334.

484

— Description of new Fossil Crinoidea from the Palæozoic Rocks of the Western and Southern Portions of the United States. 10 pp. 1 pl. <Vol. I, page 71. 1857.

Missouri localities of several species are given, and the name of *Poteriocrinus longidactylus*, Shum. described in Swallow's 2nd Report, changed to *P. Missouriensis*.

485

— Descriptions of New Species of Blastoidea from the Palæozoic Rocks of the Western States, with some Observations on the Structure of the summit of the genus *Pentremites*. 11 pp., 1 pl. <Vol. I, page 238.

This has a table of genera and species of Blastoidea found in Missouri and other western and southern States.

486

SHUMARD.—Observations on the Geology of the County of Ste. Genevieve, being an abstract from a Report made to the Missouri Geological Survey, in 1859. 12 pp. <Vol. I, page 404.

487

SHUMARD.—Notice of some new and imperfectly known Fossils from the Primordial Zone Potsdam Sandstone and Calciferous Sand Group of Wisconsin and Missouri. 7 pp. <Vol. II, page 101. 1863.

Describes the following :

Straparollis valvatiformis, page 105.

Murchisonia Ozarkensis, page 106.

M. carinifera, page 106.

Raphistoma subplana, page 106.

Orthoceras Ozarkensis, page 107.

Lituities complanata, page 197, all from the 3d Magnesian Limestone of Ozark County.

488

— Description of New Palæozoic Fossils. 6 pp. <Vol. II, page 108. 1863.

Describes the following :

Eleacrinus Kirkwoodensis, page 113, from the St. Louis Limestone, near Kirkwood.

489

SHUMARD, B. F. & SWALLOW, G. C.—Descriptions of New Fossils from the Coal Measures of Missouri and Kansas. By B. F. Shumard and G. C. Swallow. 32 pp. <Vol. I, page 198. 1858.

Describes the following :

Nautilus Missouriensis, Swallow, page 198, from the Hydraulic Limestone, Lower Coal Measures, Boone County.

Goniatites politus, Shum., page 199, from the Middle Coal Measures at Lexington.

G. minimus, Shum., page 200, from the Middle Coal Measures at Dover Landing.

Macrocheilus Missouriensis, Swallow, page 201, from the Lower Coal Measures of Howard County.

Naticopsis (Nerita) Pricei, Shum., page 202, from the Upper Coal Measures of Boone County.

Murchisonia minima, Swallow, page 203, from the Middle Coal Measures at Lexington.

Bellerophon Meekianus, Swallow, page 205, from the Middle Coal Measures at Lexington, and the Lower Coal Measures of Howard County.

Cypricardia plicatula, Swallow, page 205, from the Middle Coal Measures of Platte County, and Lower Coal Measures of Howard County.

Isocardia (?) curta, Shum., page 206, Coal Measures at Charboniere.

Cardium (?) Lexingtonensis, Swallow, page 206, from the Middle Coal Measures at Lexington.

Cardiomorphia Missouriensis, Shum., page 207, from the Coal Measures at Charboniere and Lexington.

- Leptodomus Topekaensis*, Shum., page 208, from the Coal Measures below the mouth of the Kansas River.
- Allorisma cuneata*, Swallow, page 210, from the Middle Coal Measures at Lexington.
- A. lata*, Swallow, page 210, from the same.
- Lingula carbonaria*, Shum., page 215, from the Coal Measures of Clark Co.
- Orthis carbonaria*, Swallow, page 218, from the Middle Coal Measures at Lexington.
- Orthisina Missouriensis*, Swallow, page 219, from the Upper Coal Measures at Dallas.
- Rhynchonella (Camarophoria), Osagensis*, Swallow, page 219, from the Upper Coal Measures of Missouri.
- Retzia punctilifera*, Shum., page 220, from the Upper Coal Measures of Audrain and Howard counties.
- Discina Missouriensis*, Shum., page 221, from the Middle Coal Measures at Lexington and Charboniere.
- Poteriocrinus rugosus*, Shum., page 223, from the Coal Measures, Bluffs of the Missouri River and Putnam county.
- P. hemisphericus*, Shum., page 221, from the Coal Measures on Hinkston Creek, Boone county, and at Lexington.
- Archeocidaris biangulatus*, Shum., page 224, from the Middle Coal Measures at Lexington.
- Phillipsia Missouriensis*, Shum., page 225, from the same.
- P. major*, Shum., page 226, from the Upper Coal Measures of Clinton county.

489

SWALLOW.—Grape Culture in Missouri. 13 pp. 1 pl. <Vol. I, page 156.

490

SWALLOW.—Descriptions of New Fossils from the Carboniferous and Devonian of Missouri. 26 pp. <Vol. I, page 635. 1860.

Describes the following:

- Strophodonta navalis*, page 635.
- S. cymbiformis*, page 635.
- S. subcymbiformis*, page 636.
- S. Kemperi*, page 636.
- S. inflexa*, page 637.
- S. altidorsata*, page 637.
- S. Boonensis*, page 638, all from the base of the Devonian, in Callaway County.
- S. Callawayensis*, page 638.
- S. quadrata*, page 639.
- S. æquicostata*, page 639, all from the Hamilton rocks of Callaway County.
- Orthis Missouriensis*, page 639, from the Chemung rocks of Cooper and Marion Counties.
- Productus Callawayensis*, page 640, from the Lower Devonian of Callaway County.
- P. Cooperensis* [sic], page 640, from the Chouteau Limestone of Cooper County.
- P. magnicostatus*, page 641, from the Coal Measures of Johnson County.
- Spirifer Annæ*, page 641, Hamilton Rocks, Callaway County.

- S. Osagensis*, page 641, from the Chemung rocks of Pettis County.
S. Missouriensis, page 643.
S. Cooperensis, page 643, (Illinois Survey, Vol. II, page 155, Pl. 14, Figs. 5a, 5b), both from the Chouteau of Cooper County.
S. Vernonensis, page 644.
S. Taneyensis, page 645, both from the Chemung rocks of Taney County.
S. Meekii, page 645, from the Eocerinital of Pettis and Saline Counties.
S. lineatoides, page 645, from the Eocerinital of Missouri.
S. Littoni, page 646, from the St. Louis Limestone of St. Louis Co.
S. Boonensis, page 646, from the Lower Coal Measures of Randolph and Monroe counties.
S. (Cyrtia) Hannibalensis, page 647, from the Lithographic Limestone of Marion county.
Cyrtia Missouriensis, page 647.
C. occidentalis, page 648.
Spirigera minima, page 649.
S. Fultonensis, page 650, all the Hamilton Rocks of Callaway county.
S. Proutii, page 649, from the Chemung rocks of St. Louis Co.
S. Hannibalensis, page 649, from the same at Hannibal, Louisiana and Sulphur Springs, St. Louis Co.
S. Missouriensis, page 650, from the Coal Measures of Montgomery and Chariton counties.
S. Maconensis, page 651, from the same of the former county.
S. Charitonensis, page 651, from the Coal Measures of Montgomery and Chariton counties.
S. Jacksoni, page 651, from the Upper Coal Measures of Cass Co.
T. Hawnii, page 652, from the Coal Measures of Missouri.
Pentamerus Salinensis, page 652, from the Devonian at base of Chemung, Moniteau Co.
Rhynchonella Warrenensis, page 653, from the Lower Devonian of Callaway Co.
R. ringeus, page 653, from the Eocerinital Limestone of Callaway Co.
Retzia Osagensis, page 653, from the Chemung rocks of Cooper and Benton counties.
R. (?) Popenana, page 654, locality not stated.
Edmondia Marionensis, page 654.
Cardiomorpha (?) triangulata, page 655, both from the Chouteau Limestone of Cooper county.
Cardinia occidentalis, page 655, from the Chouteau Limestone of Cooper, Saline and Moniteau counties.
Solen (?) Missouriensis, page 655, from the ? of Pike Co.
Allorisma ensiformis, page 656, from the Coal Measures of Clay Co.
Conularia Marionensis, page 656, from Hannibal and Marion Co.
C. triplicata, page 657, from Marion Co., both from the Upper Hamilton Shales.
C. Missouriensis, page 657, from the Carboniferous Limestone of Cooper Co.
Trochus Missouriensis, page 657, from the Coal Measures of Jackson Co.
Littorina Wheeleri, page 658, from the Coal Measures of Monroe Co.
Nautilus Lawsii, page 658, from the Hamilton rocks of Callaway Co.
N. Gilpini, page 658, from the Coal Measures of Wayne Co.
Goniatites Morganensis, page 659, from the Chemung of Missouri.
G. (?) Holmesii, page 659, from the same of Cooper Co.

- G. Osagensis*, page 659, from the same of Cooper and Moniteau Cos.
Orthoceras Chemungense, page 660, from the Lithographic Limestone of Marion and Pike Cos.
O. Chemungense var. *Chouteauense*, page 660, from the Chouteau Limestone of Cooper Co.

491

SWALLOW.—Descriptions of some New Fossils from the Carboniferous and Devonian Rocks of Missouri. 20 pp. <Vol. II, page 81. 1863.

Describes the following :

- Pentremites Missouriensis*, page 81, from the Archimedes Limestone of Missouri.
Orthis Clarkensis, page 81, from the Keokuk Limestone of Missouri.
O. Cooperensis, page 82, from the Warsaw Limestone of Cooper Co. and Barrett's Station.
Orthisina occidentalis, page 82, from the Upper Coal Measures of Caldwell Co.
Terebratula gracilis, page 83, Upper Archimedes, St. Marys.
T. parva, page 83, from ? of Monroe and Cooper Cos.
T. arcuata, page 83, Kaskaskia Limestone, Ste. Genevieve Co.
T. brevilobata, page 84, Archimedes Limestone, Ste. Genevieve Co.
Rhynchonella arctirostrata, page 84, and
R. perrostellata, page 85, both Archimedes Limestone, Cooper Co.
Spirifer translatus, page 85, Archimedes Limestone, St. Marys.
S. Kelloggii, page 86, Keokuk Limestone from ?.
S. levigatus, page 86, Keokuk of Missouri.
S. latior, page 86, Chouteau Limestone, Cooper Co.
S. clarus, page 86, Archimedes, Ste. Genevieve Co.
Spirigera Plattensis, page 87, Upper Coal Measures, Nw. Mo.
S. Singletonii, page 87, Lower Coal Measures, Boone and Audrain Cos.
S. reflexa, page 88, 3rd Archimedes or Warsaw, Barrett's Station.
S. Clintonensis, page 89, 2nd Archimedes, Ste. Genevieve and Cooper Cos.
S. Americana, page 89, 2nd Archimedes, St. Marys.
S. caput-serpentis, page 90, Upper Coal Measures of Missouri.
S. formosa, page 91, Archimedes above Boonville.
S. euzonia, page 91, Archimedes, Cooper Co.
Productus Americanus, page 91, Upper Coal Measures of Harrison Co.
P. auriculatus, page 91, locality and horizon not given.
P. Fentonensis, page 93 from ? of St. Louis Co.
P. depressus, page 93, Keokuk Limestone, Fenton, St. Louis Co.
P. gradatus, page 93, Keokuk Limestone, Lewis and St. Louis Cos.
P. coraformis, page 94, Archimedes Limestone, Cooper Co.
Koninckina Americana, page 94, 3rd Archimedes Limestone, Barrett's Station, St. Louis Co.
Allorisma antiqua, page 95, Kaskaskia Limestone of Missouri.
Cypriardia (?) *Pikensis*, page 95, Coal Measures of Pike Co.
C. (?) *Wheeleri*, page 96, Upper Coal Measures, Caldwell Co.
C. (?) *Chouteauensis*, page 96, Chouteau Limestone, Cooper Co.
C. (?) *occidentalis*, page 96, from ?, Caldwell Co.
Pecten Broadheadi, page 97, Upper Coal Measures, Harrison Co.
Pinna Missouriensis, page 97, Ste. Genevieve Limestone of Missouri.

Avicula magna, page 98, Archimedes Limestone, Knox Co.

Conularia Osagensis, page 98, Archimedes Limestone near Boonville.

Orthoceras Chesterense, page 98, Ste. Genevieve Limestone, near St. Marys.

492

SWALLOW.—Some New Varieties of *Spirifer lineatus*, Martin; *Spirifer cameratus*, Morton; *Spirifer Kentuckensis*, Shumard; *Spirifer Leidyi*, Norwood and Pratten; *Spirifer increbescens*, Hall, and *Spirifer Keokuk*, Hall. 3 pp. <Vol. II, page 408. 1866.

Describes the following:

Spirifer lineatus, var *striato-lineatus*, page 408, from the Upper and Middle Coal Measures of Missouri.

S. Kentuckensis, var *propatulus*, page 409, Upper Coal Measures of Missouri.

S. Leidyi, var *Chesterensis*, page 409, Ste. Genevieve Limestone.

S. Leidyi, var *Merimacensis*, page 410, Archimedes, Barrett's Station.

S. increbescens, var *Americana*, page 410, Kaskaskia Limestone in Missouri.

S. Keokuk, var *Shelbyensis*, page 410, Archimedes Limestone, Shelby Co.

493

WHEELER, O. B.—The Secondary Base in Geodetic Surveys. By O. B. Wheeler. 12 pp. 1 folded plate. <Vol. V, page 21.

494

WISLIZENUS, A.—Was Man cotemporary with the Mastodon? By A. Wislizenus, M. D. 4 pp. <Vol. I, page 168.

495

WORTHEN, A. H.—Abstract of "Review of some points in Dr. B. F. Shumard's Report on the Geology of Ste. Genevieve County, Mo." By A. H. Worthen. 2 pp. <Vol. I, page 696.

496

KOCH.—Remarks concerning Mastodon Remains and arrow head found in Missouri, and on Dr. Wislizenus' paper, by Dr. Koch. 2 pp. <Vol. I, page 116.

SCHOOL OF MINES QUARTERLY.

497

KEMP, J. F.—Notes on the Ore Deposits, and Ore Dressing in South-eastern Missouri. By J. F. Kemp, E. M. 8 pp. <Vol. IX, page 74. 1887.

498

KEMP, J. F.—Notes on Lead-Smelting in Southeastern Missouri. By J. F. Kemp. 8 pp. <Vol. IX, page 212. 1888.

499

MAYNARD, G. W., AND KUNHARDT, W. B.—On the Dressing of Non-Bessemer Ores. By G. W. Maynard and W. B. Kunhardt. 18 pp. <Vol. IX, page 145.

500

NEWBERRY, J. S.—The Genesis of the Ores of Iron. By J. S. Newberry. 17 pp. <Vol. 1, Nov. 1880.

SEDALIA NATURAL HISTORY SOCIETY BULLETIN.

501

HAMBACH, G.—Pettis County Pentremites. By Dr. G. Hambach. <Bulletin No. 1, Sedalia, Mo., 1885, pp. 29-30.

The descriptions of *Pentremites Sampsoni* and *Condites campanulatus* from Pettis county, are copied from the Trans. St. Louis Acad. Sci.

UNITED STATES ASSOCIATION OF CHARCOAL IRON
WORKERS' JOURNAL.

502

BIRKENBINE, J.—Narrative of the Fifth Annual Meeting of the United States Association of Charcoal Iron Workers, held at St. Louis, Mo. (Aug. 30, 1884.) (John Birkenbine, Secretary.) 12 pp. <Vol. V, page 291.

Contains descriptions of the iron mines and furnaces in the neighborhood of St. Louis.

503

POTTER, W. B.—The Iron Ore Regions of Missouri. By W. B. Potter. 18 pp. 1 folded map of the iron regions of Missouri. <Vol. VI, page 23.

WESTERN JOURNAL AND CIVILIAN.

(A magazine published in St. Louis from 1848 until 14 volumes and 3 numbers were issued.)

504

ANONYMOUS.—Missouri Iron, Shipments from Ste. Genevieve, June 1 to December 1, 1853. (From Ste. Genevieve Plaindealer.) 1 p. <Vol. XI, page 290.

505

BUCKLIN.—Report of the Engineer on the Preliminary Surveys and Location of the Hannibal & St. Joseph R. R. By James M. Bucklin, Chief Engineer. <Vol. X. pp. 272-277. 1853.

This has an account of the minerals of North Missouri, with a section of seventy miles of the North Missouri coal field.

506

COBB, H.—Geological Survey of Missouri. By H. Cobb. 2 pp. <Vol. IX, page 319.

507

— Southeast Missouri. By H. Cobb. <Vol. IX, pp. 313-318.

508

— Manufacture of Missouri Iron. 2 pp. <Vol. XI, page 370.

509

— Missouri Railroad Iron. 3 pp. <Vol. XI, page 442.

510

— Missouri Coal. <Vol. XI, page 273.

511

— Geological Survey of Missouri. <Vol. XII, o. s. Vol. XII [6] n. s., pp. 1-7. 1854.

512

EDITORIAL.—New Madrid Earthquake. 5 pp. <Vol. XVII, page 586.

513

— Railroad from St. Louis to New Orleans. Missouri & Arkansas Railroad. U. S. Survey, etc. <Vol. VIII, pp. 408-422. 1852.

This has a full account of the Joshua Barney survey, the report of which was published by the government at Washington.

514

KING, H.—Geological Survey of the State of Missouri. By Dr. H. King. 18 pp. <Vol. III, page 12.

515

— Geological Survey of the State of Missouri. 8 pp. <Vol. III, page 76.

516

— Some Remarks on the Geology of the State of Missouri. 15 pp. (Read before the A. A. S. May, 1851, and published in Proceedings.) <Vol. VIII, page 228.

517

MAUGHAS, M. M.—Geological Researches in Missouri. By Dr. M. M. Maughas. (Read before the Missouri Hist. & Phil. Ass'n, Jan., 1853.) 15 pp. <Vol. IX, p. 382.

518

MEMORIAL.—St. Louis & Iron Mountain Railroad Memorial. To the City Council of the City of St. Louis. <Vol. X, pp. 277–281.

This is a memorial prepared by a committee of the Board of Directors of the railroad to solicit a subscription from the city to the railroad, and it details the mineral advantages to the city in opening up the country to be traversed by the railroad.

519

MOSELY, W. S.—New Madrid, Missouri. By Wm. S. Mosely. 6 pp. <Vol. III, p. 385.

This describes the region affected by the earthquake of 1811–12.

520

MOSELY.—Lead Mines in Southwest Missouri. 3 pp. <Vol. IV, page 411.

521

PROUT, H. A.—The Geology and Mineral Resources of the State of Missouri. By Dr. H. A. Prout. 4 pp. <Vol. I, page 6.

522

PROUT.—On the Geology of the Valley of the Mississippi. 10 pp. <Vol. I, page 243.

523

PROUT.—On the Economic Geology of the State of Missouri. 11 pp.
<Vol. I, page 429.

524

RISK, T. F.—Geological Survey of Missouri. By T. F. Risk. 5 pp.
<Vol. II, page 333.

525

ROZIER, F. A.—Submerged Lands of Missouri. 6 pp. <Vol. III, pp.
391–396.

This is a report presented to the "Southwestern Convention," held at
Memphis in 1845, signed by Firmin A. Rozier, Chairman.

526

SHEPARD.—Remarks of Prof. Shepard of Yale College, on the Iron
Mountains in Missouri. 3 pp. <Vol. VIII, page 140.

527

SINGLETON, WM. R.—Iron Mountain and Iron Works of Missouri. By
Wm. R. Singleton, Principal Engineer of Ste. Genevieve, Iron
Mountain and Pilot Knob Plankroad. 7 pp. <Vol. VIII, page 136.

528

TARVER, M.—Manufacture of Iron in St. Louis, Iron Mountain and
Iron Ore in Missouri. Causes hindering the Production of Iron in
Missouri, &c., &c. By M. Tarver. 4 pp. <Vol. I, page 36.

529

TARVER.—Blow's White Lead and Oil Factory. 1 page. <Vol. I,
page 99.

530

TARVER.—Manufactures in St. Louis. Lead Pipe and Sheet Lead
Manufactory, Copper Work, Bell and Brass Foundry, etc. 1 page.
<Vol. I, page 445.

531

WOOLFORD, F.—Mines and Mining. Mineral Resources of Washington
County, Missouri. By Frederick Woolford. 3 pp. <Vol. I, page
163.

532

WOOLFORD.—Clays and Minerals of Missouri. 3 pp. <Vol. I, page
192.

WESTERN QUARTERLY.

533

ANONYMOUS.—New Mineral Discoveries. <Vol. I, No. 1, July 1868, pp. 89-90.

This has an account of the discovery of copper and antimony in Cedar county, copied from the *Missouri Democrat*, and a notice of the Webster county lead mines, from the *Springfield Patriot*.

534

EDITORIAL.—The Advantages and Resources of Missouri. <Vol I, No. 1, July, 1868, pp. 4-8.

This relates principally to the mineral resources.

535

— Will Mining in Missouri pay ? <Vol. I, No. 1, July, 1868, pp. 24-27.

536

— Tin in Missouri. <Vol. I, No. 1, July, 1868, pp. 31-34.

PART V.

Miscellaneous Publications.

ALPHABETICAL LIST.

537

ALLEN, T.—Missouri: its History, Characteristics, Resources and Present Condition. A Discourse delivered at the request of the U. S. Centennial Commission, and by appointment of the Governor of the State, in the Judges' Hall of the International Exposition. Centennial Celebration, at Philadelphia, July 28, 1876. By Thomas Allen, of St. Louis. Philadelphia: Printed for the Missouri Commission, 1876, 29 pp.

The mineral resources and kindred subjects are treated of on pp. 20-26.

538

ANONYMOUS.—A Hand-book of Northwest Missouri. Published by the Northwest Missouri Immigration Society. 1889. 144 pp., illustrations.

The minerals of the counties of the part of the State described are shown in the county descriptions.

539

— [R. B.]—View of the Valley of the Mississippi, or the Emigrant's and Traveler's Guide to the West. * * * * Second Edition, Philadelphia: Published by H. S. Tanner. 1834. 12°, 372 pp.

Missouri and its Minerals are given on pp. 235-250.

540

ANONYMOUS.—Mineral Wealth of Missouri. Iron Mountain and Pilot Knob, 2 pp., 2 plates. <History of St. Louis, Commercial Statistics, &c. From the St. Louis Republican, January 10, 1854. St. Louis, Mo. 1854. pp. 41-42.

The two plates give views of Iron Mountain and Pilot Knob.

541

— Prospectus, Charter and By-Laws of the Stanton Copper Mining Company. Organized, 1854. Treasurer's office, No. 10 Chesnut Street, St. Louis, Mo. St. Louis: Printed at the Republican Office, 1855. 35 pp.

The geology of the region about the mine in Franklin county is given.

542

— Der Eisenberg am Missouri. 1 page. <Die Natur. Dr. Otto Ule und Dr. Karl Muller. Vol. V, No. 26, page 208. 1856.

The above is a communication signed B.

543

— Southern Missouri, its Resources and Elements of Wealth, being a general description of the soil, face of the country, productions, improvements, &c., together with a copy of the Graduation Act, and an Essay of Prof. G. C. Swallow, State Geologist of Missouri, on the Culture of the Grape, by Leffingwell, Clark & Co. Plates. 16 pp. 1859.

544

— Sectional maps showing the location of One Million Acres Choice Agricultural and Mineral Lands on the line of the South Pacific Railroad in the State of Missouri, with statistics of the counties and towns, and description of the lands, price per acre, etc. * * * St. Louis. Land Department South Pacific Railroad Company, 1868, 12°, 40 pp. Map and many plats.

545

— Proceedings of a Convention of Delegates for the Promotion of Internal Improvements within the State of Missouri, held at the city of St. Louis, on the twentieth day of April, 1836. St. Louis: Printed by Charles Keemle. 1836. 30 pp.

The development of the mineral resources of the State was one reason urged for the State's assisting in the building of railroads.

546

ANONYMOUS.—Newton County, Missouri. Its Agricultural, Mineral and Manufacturing Interests, Educational and Industrial Advantages. The Home for the Emigrant. Neosho, Mo. Printed at the Neosho Journal Book and Job office, 1873. 16°, 8 pp.

This was issued by the Newton County Immigration Society.

547

— The Mineral Wealth of Southwest Missouri. The Lead and Zinc Mines of Granby, Minersville, Joplin, Grove Creek, Stevens Mines, Thurman, Conwell, Conley, and others. Published by Lloyd & Bauman, Joplin, Mo. 1874. 64 pp.

There is an accompanying Map of the Lead Region of Southwest Missouri, by Lloyd & Bauman.

548

— A Sectional Map Book of the Atlantic and Pacific Railroad lands.
* * * St. Louis, Mo. 31 pp. Maps. 1874. (?)

This gives an account of the mineral lands in the part of the State near the railroad.

549

— Washington County, Missouri. Its Agricultural, Mineral and Manufacturing Resources. Independent Print, Potosi, Mo., May, 1880. 12°, 9 pp.

550

— Carthage and Jasper County. What and where they are. * *
Carthage, Missouri, 1887. 58 pp. Map and many illustrations.

This was issued by Carthage Board of Trade. It has an account of the Mining Interests, Lead, Zinc and Coal, pp. 33-43.

551

— Iron and Steel. An account of another Holiday outing of the Boys and Girls. By a Man of the Great Rock Island Route, Chicago. 1888. 98 pp. 12°.

This has an account of the Iron Mountain Iron Mines.

552

— Pleasanton, Kansas, its Coal Fields, Resources and Advantages. Herald Job Office, Pleasanton, Kas. 32 pp. 12 figs.

This was published by the Pleasanton Commercial Club, and has an account of the Rich Hill mining region.

553

ANONYMOUS.—Hand-Book of Macon County, Missouri. The Blue Grass region of North America. Macon Mo. 1888. Folio. Pamphlet.

The coal mines and other mineral resources of the county are described on pp. 3-5 and 25.

554

— The Good Luck Mining and Smelting Co., of Aurora, Missouri. Prospectus, 4 pp. 16mo. [1890.]

This gives various facts in relation to the lead and zinc mines of Aurora.

555

ARNOLD, A.—Morgan County, Missouri. Pen Pictures of its unsurpassed advantages of soil, climate, timber, water power and rich mineral resources, schools, society, etc. [By A. Arnold.] Versailles, Mo. 1887. 20 pp.

556

ATWATER, C.—Remarks made on a Tour to Prairie Du Chin; thence to Washington City, in 1829. By Caleb Atwater, Late Commissioner employed by the United States to negotiate with the Indians of the Upper Mississippi for the purchase of Mineral Country; and author of Western Antiquities. Columbus, O. Published by Isaac N. Whiting. 1831. 12°. 296 pp.

An account of his travels in Missouri is given at pages 40-56.

557

BECK, L. C.—Gazetteer of Missouri and Illinois. By Lewis C. Beck, Albany, N. Y. 1823. *

There are items on many pages relating to the geology and mineralogy of Missouri.

558

BELTRAMI, J. C.—A Pilgrimage in Europe and America, leading to the Discovery of the Source of the Mississippi and Bloody River; with a Description of the whole source of the former, and of the Ohio. By J. C. Beltrami, Esq. Formerly Judge of a Royal Court in the ex-Kingdom of Italy. In two volumes. London. Printed for Hunt and Clark, York street, Covent Garden. 1828.

Letter XIII, pp. 100-125 of the second volume, was written from St. Louis, and about Missouri.

559

BLISS, N. W.—East-South Missouri. The counties immediately adjoining and contiguous to the great river and the city of St. Louis. Their resources—advantages—soils—climate—products—mineral deposits—water powers, etc. By N. W. Bliss. Published by Union Mining and Smelting Company, Old Mines, Washington County, Mo., and Washington Land and Mining Company, Kingston Furnace, Washington County, Mo. St. Louis address: C. S. Greeley, President U. M. & S. Co. and W. L. & M. Co., 620 N. Second Street, St. Louis, Mo. Issued under the authority and with the indorsement of the Missouri Immigration Society. (St. Louis. 1882.)

560

BOARD OF IMMIGRATION¹.—Hand-Book of Missouri, embracing exhibits of the agricultural, etc., etc.—Published by the Missouri Immigration Society, issued by the Missouri State Board of Immigration. St. Louis: Times Printing House, Fifth and Chestnut Streets. 1881. 278 pp.

This is also found with a title page which does not show that it was originally issued by the State Board.

561

BRACKENRIDGE, H. M.—Views of Louisiana: together with a Journal of a Voyage up the Missouri River, in 1817. By H. M. Brackenridge, Esq. Pittsburgh. Printed and Published by Cramer, Spear and Eichbaum. Franklin head office. 1814. 304 pp.

An account of the soil and face of the country is given on pp. 103-110, and of the Lead Mines of Ste. Genevieve on pp. 146-155.

562

—Recollections of Persons and Places in the West. By H. M. Brackenridge, a native of the Ohio. Philadelphia: James Kay, Jun. and Brother. [1835.] 18°. 244 pp.

The author lived at Ste. Genevieve, and he starts on his travels from there, and returns by way of New Madrid.

¹This title belongs properly with the reports of the Missouri State Board of Immigration; but it was obtained too late for insertion in its proper place.

563

BRADBURY, J.—Travels in the Interior of America, in the years 1809, 1810 and 1811: including a description of Upper Louisiana, together with the States of Ohio, Kentucky, Indiana and Tennessee, with the Illinois and Western Territories, and containing remarks and observations useful to persons emigrating to those countries. By John Bradbury, F. L. S. London, * * * * * Liverpool, * * * * * 1817.

An account of the New Madrid earthquake is given on pp. 199-207, and the minerals of the State are also noticed.

564

BRADFORD.—Notes on the Northwest, or Valley of the Upper Missouri, comprising - - - and Northern Illinois and Missouri. New York and London. 1846. 12°. 302 pp.

Pages 200-270 are on the geology of the region, including Missouri.

565

BROADHEAD, G. C.—Geological Report upon the Mineral Lands of Major R. H. Melton. By G. C. Broadhead, Former State Geologist of Missouri. Sedalia. 1880. 12 pp.

566

—(The geology of Missouri.) <The American Cyclopædia. Appleton. 1875. In article on "Missouri." pp. 665-666.

I am informed by Prof. Broadhead that he wrote the part of the article above mentioned.

567

BROCKETT.—Our Western Empire; or the New West Beyond the Mississippi. Illustrations and maps. Phil. 1882. 1312 pp.

Chapter XII, pp. 927-955, has an account of Missouri, including its geology.

568

BUCKLIN, J. M.—Report of the Preliminary Surveys and Location of the Hannibal and St. Joseph Railroad. By James M. Bucklin, Chief Engineer.*

This describes the coal beds along the line of the road.

569

BUSKETT, J. L.—A Short Description of the Lost Hill and Evans Lead Mines in Franklin County, Mo. (By J. L. Buskett, 614 Pine Street. 1873 or later.) 12°. 8 pp.

570

CAMPBELL, R. A.—Material Wealth. The Resources, Productions, Possibilities of Missouri. By Robert Allen Campbell, C. E. Author of "Campbell's Gazetteer of Missouri," etc. <Switzler's History of Missouri. Part IV. 1879.

571

CHRISTY, J. M.—Letters on Geology: being a series of communications addressed to Dr. John Locke, of Cincinnati, giving an outline of the Geology of the West and South West, together with an essay on the Erratic Rocks of North America, addressed to M. De Verneuil. Illustrated by Geological sections and Engravings of some rare Fossils. By David Christy. Rossville: J. M. Christy. Main St. 1848.

572

CRAWFORD, A. L. & SCOTT, WM. L.—Prospectus of the Iron Mining Comp'y of Missouri, and the St. Louis, Salem & Little Rock R. R. Erie Observer Power Presses. 1872. (A. L. Crawford, New Castle, Pa. Wm. L. Scott, Erie, Pa.) 12°. 12 pp.

573

DADDOW, S. H. & BAUMAN, B.—Coal, Iron and Oil; or, the Practical American Miner. * * * * By Samuel Harriss Daddow and Benj. Bauman. Pottsville, Pa. 1866.

There is an account of the iron mines of Missouri on pages 550-552.

574

DANA, J. D.—Manual of Geology, . . . with special reference to American Geological History. By James D. Dana. Phil. 1865. Revised edition.

This contains many references to the geology of Missouri.

575

DAVIS, W. B. & DURRIE, D. S.—Physical Geography of Missouri. 16 pp. <An illustrated History of Missouri, comprising its early record, and civil, political, and military history from the first exploration to the present time, etc. By Walter Beckford Davis and Daniel S. Durrie, A. M. St. Louis: A. J. Hall & Co. 1876. Chapter XXIV, pages 228-245.

This has an account of the geology and minerals of the state, and a portrait of Prof. G. C. Swallow.

576

FARMER, J.—Map of the Most Important part of the Lead Regions near the Mississippi river. John Farmer. 1836.

577

FEATHERSTONHAUGH, G. W.—Excursion through the Slave States, from Washington on the Potomac to the frontier of Mexico ; with sketches of popular manners and geological notices. By G. W. Featherstonhaugh, F. R. S., F. G. S. New York: Harper & Brothers. 1844. 168 pp.

Chapters XVI to XXIII, pages 62-88, are about Missouri, including the results of trips to the iron and lead mines.

578

FLINT.—History and Geography of the Valley of the Mississippi. 2nd Edition. Cincinnati. 1832.

579

FORSHEY, C. G.—Delta of the Mississippi river. By Col. C. G. Forshey of Louisiana. (*)

The author was of the opinion that the proper delta of the Mississippi extended to within a few miles of Cape Girardeau.

580

FOSTER.—The Mississippi Valley : its Physical Geography, including sketches of the Topography, Botany, Climate, Geology and Mineral Resources ; and of the Progress of Developement in Population and Material Wealth. Illustrated by maps and sections. Chicago : S. C. Griggs & Co. 1869. 443 pp.

581

GODFREY, C. O.—What shall we burn? A Treatise on the Bituminous Coals of the West. Office of C. O. Godfrey, Hannibal, Missouri. St. Louis. 1872. 14 pp.

582

GURLEY, WM. F. E.—New Carboniferous Fossils. Bulletin No. I. By Wm. F. E. Gurley. September 24, 1883.

The following are described ; there are no figures :

Crania Rowleyi, page 3.

Cornulites carbonarius, page 8.

Spirorbis Kinderhookensis, page 9, all from the Kinderhook division of the Sub-Carboniferous, Pike county.

Bellerophon textiliformis, page 6.

Discites Toddanus, page 7, both from the Upper Coal Measures, Kansas City.

583

GURLEY.—New Carboniferous Fossils. Bulletin No. 2. February 25, 1884. 12 pp.

The following are described :

Ptychostylus heterocostalis, page 5.

Lepetopsis Parrishi, page 7, both from the Upper Coal Measures at Kansas City.

Ptychostylus subtumidus, page 6, from the Kinderhook Shales, Pike County.

584

GWYNN, J. K.—Minerals and Mining. <Southwest Missouri. Prepared and published by the Southwest Missouri Immigration Society. J. K. Gwynn, Secretary, Clinton, Mo. St. Louis. 1888. pp. 15-18.

There are also reports of the minerals of each county that is described in the pamphlet.

585

HALL, J.—Supplementary Note on the Potsdam Sandstone. James Hall. <In "Contributions to Palæontology," in the Sixteenth Annual Report of the Regents of the University of New York for 1863, pp. 210-220.

The Magnesian Limestones of Missouri are considered in this paper.

586

HARLAN, R.—Medical and Physical Researches by Richard Harlan, M. D. Phil. 1835.

Contains description of *Bos Pallassii*, DeKay, from New Madrid, on page 253.

587

HAWORTH, E.—A Contribution to the Archæan Geology of Missouri. An inaugural dissertation presented to the Board of University Studies of the Johns Hopkins University, with an application for the degree of Doctor of Philosophy, by Erasmus Haworth, M. S. Minneapolis, Minn. The University Press, State University. 1888. 40 pp.

This was also published in Johns Hopkins University Circulars, Vol. VIII, No. 65, and in the American Geologist.

588

HAYWARD, W. W.—Moniteau County, Missouri, its Geographic Features, Agricultural and Mineral Resources, etc., etc. Published by W. W. Hayward & Co., California, Missouri, July, 1875. 12mo, 32 pp.

An account is given of the mines of coal, zinc, lead, barytes, etc., pp. 11-16.

589

HEWITT, A. S.—A Century of Mining and Metallurgy in the United States. Centennial Address of Hon. Abram S. Hewitt, President elect of the American Institute of Mining Engineers. Phil. June 20, 1876. 33 pp. <Vol. V, Trans. Amer. Inst. Mining Eng'rs, pp. 164-193.

590

HOGAN, J.—Thoughts about the City of St. Louis, her Commerce and Manufactures, Railroads, &c. First Published in the Missouri Republican, St. Louis, Mo.; Republican Steam Press Print, 1854. 80 pp. 15 full-page and 1 folded plate.

These "Thoughts" are signed J. H., and were written by John Hogan. Nos. XXI, XXII and XXIII, pages 40-47, treat of the iron, lead, copper, coal and other minerals of the State.

591

KING, H.—The Grand Tower Iron Works, Perry County, Missouri. Incorporated June 11, 1853; capital \$500,000. New York: Printed by Edward O. Jenkins, No. 114 Nassau Street. 1853. 20 pp.

This contains a geological report on the locality by Dr. H. King.

592

— Report on an examination of the estate belonging to the St. Louis and Birmingham Iron Mining Company. By order of the Board. St. Louis. Printed at the St. Louis Times Book and Job Office. 1852. 18 pp.

This contains a geological report by Dr. H. King.

593

KING, ET AL.—Charter and By-Laws of the St. Louis and Birmingham Iron Mining Company, together with reports on an examination of the estate. New York: Baker, Godwin & Co., Printers, corner Nassau and Spruce Streets. 1853. 35 pp.

This contains geological reports by Dr. H. King and J. D. Whitney, and analyses of ore by Charles T. Jackson.

594

KING.—The Great South. Some notes on Missouri: The Heart of the Republic. By — King. <Scribner's Monthly, July, 1874, Vol. VIII, pp. 257–283. 26 figs.

This has descriptions and illustrations of Iron Mountain and Pilot Knob.

595

KIRKWOOD.—Report of the Chief Engineer. January 10, 1851. <First Annual Report of the Board of Directors of the Pacific Railroad; and the Report of the Chief Engineer upon the Preliminary Surveys. St. Louis, Mo.: Printed at the Republican Book and Job Office. 1851.

This has a map and section showing elevations along the different routes surveyed, with descriptions of these routes and of the country through which they run.

596

KOCH.—Fossil Remains. 8 pp. 1 Pl. No title page. No name.

This gives an account of the discovery of antediluvian remains made in May, 1831, on the premises of Capt. Palmer, 22 miles south of St. Louis, in Jefferson county; also a description of other large bones disinterred in 1838 in Gasconade county. The pamphlet is evidently by Dr. Koch, and was probably published before 1841. The copy examined is in the St. Louis Public School library, and was formerly in that of Dr. Shumard.

597

KOCH, A.—Description of the Missouri Leviathan, together with its supposed habits; Indian traditions concerning the location from whence it was exhumed; also, comparisons of the Whale, Crocodile and Missouriium with the Leviathan as described in the 41st Chapter of the Book of Job; by Albert Koch. St. Louis. 1841. 16 pp.

598

— Description of the Missouriium theristocaulodon (Koch), or Missouri Leviathan (*Leviathan Missouriensis*), together with its supposed habits, and Indian Traditions concerning the location from whence it was exhumed; also, comparisons of the Whale, Crocodile and Missouriium with the Leviathan, as described in the 41st Chapter of the Book of Job. By Albert Koch. Fourth Edition. London; E. Fisher, 33, Cannon Street, City, 1842. 23 pp. 1 Pl.

599

KOCH, A.—Description of the Missouriium Theristocaulodon (Koch), or Missouri Leviathan (Leviathan Missouriium), together with its supposed habits and Indian traditions; also, Comparisons of the Whale, Crocodile and Missouriium with the Leviathan, as described in the 41st Chapter of the Book of Job; by Albert Koch. Fifth Edition enlarged. Dublin. 1843. 28 pp. (*)

600

— Die Rissenthiere der Urwelt oder das neuentdeckte Missouriium Theristocaulodon (Sichelzahn aus Missouri), und die Mastodontoiden im Allgemeinen und Besondern, nebst Beweisen, dass viele, uns durch ihre Ueberreste bekannt gewordene Thiere nicht præadamitisch, sondern Zeitgenossen des Menschengeschlechts waren. Eine auf eigene Entdeckungen und Beobachtungen gegründete Abhandlung von Dr. Albert C. Koch, Mitglied mehrerer naturwissenschaftlichen Gesellschaften. Mit 8 Tafeln Abbildungen. Berlin. Verlag von Alexander Duncker, Königl. Hofbuchhandler. 1845. 99 pp.

601

— Lithographic print of the Missouriium, issued at Dresden. (*)

602

— Description of the Hydrargos Sillimanii: (Koch), a gigantic fossil reptile, or Sea Serpent: lately discovered by the author, in the state of Alabama, March, 1845. Together with some geological observations made on different formations of the rocks, during a Geological tour through the Eastern, Western and Southern parts of the United States, in the years 1844–1845. By Doctor Albert C. Koch, Corresponding member of the Societies of Halle, and of Dresden, &c. The Bones of this Monstrous Serpent measure 114 feet in length, and weigh seven thousand five hundred pounds. New York, 1845. 16 pp. 1 Pl.

The author's journey extended into Missouri, and he gave some accounts of the geology and of the fossils found.

603

LATROBE, C. J.—The Rambler in North America: MDCCCXXXII–MDCCCXXXIII. By Charles Joseph Latrobe. London. MDCCCXXXV.

His travels and observations in Missouri are given in Vol. I, pp. 115–163.

604

LAWRENCE, B.—A Concise Description of the Geological Formations and Mineral Localities of the Western States; designed as a Key to the Geological Map of the Same. By Byrem Lawrence. 16 mo. 44 pp. Boston. 1843.

The iron and lead of Missouri are referred to on pages 26-28.

605

LYELL, C.—A Second Visit to the United States of North America. By Sir Charles Lyell, F. R. S. In two volumes. New York. 1849.

In the second volume, pages 172-182, there is an account of the earthquake region about New Madrid.

606

— Principles of Geology, or the Modern Changes of the Earth and its inhabitants considered as Illustrative of Geology. By Sir Chas. Lyell, Bart., M. A., F. R. S. Tenth and entirely revised edition. London. 1868.

In Vol. II, pp. 106-110, of the above edition, there is an account of the New Madrid earthquake region. Pages not noted in other editions.

607

MACFARLANE, J.—An American Geological Railway Guide, giving the Geological Formation at every Railway station, with Notes on interesting places on the Routes, and a Description of each of the formations. By James Macfarlane, Ph.D. New York. D. Appleton and Company. 1879.

The account of the geological formations and localities of Missouri was written by Prof. G. C. Broadhead, and is given on pages 154-158.

A revised and enlarged edition containing 370 pages, edited by James R. Macfarlane, was issued in 1890.

608

— The Coal Regions of America: their Topography, Geology and Development. By James Macfarlane, A. M. With maps. New York: D. Appleton and Company. 1873.

An account of the Missouri coal region is given on pages 469-477.

609

MARCOU, J.—Geology of North America; with two Reports on the Prairies of Arkansas and Texas, the Rocky Mountains of New Mexico, and the Sierra Nevada of California, originally made for the United States Government. By Jules Marcou. Zurich. 1858. Folio.

The geology of Missouri is to some extent included in this report. There are other editions of the work besides the one here given.

610

MILLER, S. A.—North American Geology and Palæontology for the use of Amateurs, Students and Scientists. By S. A. Miller. Cincinnati, Ohio. 1889. 664 pp. Illustrations.

The geology of Missouri is described on pages 33, 41, 45, 58, 59, 61 and 66-77.

611

MILLS, J. E.—Geological Report on the Mine La Motte Estate, the property of Hon. Rowland Hazard, situated in St. Francois and Madison Counties, Missouri. With accompanying Map and Diagrams. By James E. Mills, B. S., Consulting Geologist. 1877. G. W. & C. B. Colton & Co., New York. 4to, 51 pp.

This has sections, diagrams and map. Folded Diagram No. 1, illustrating the General Geology of the Tract. Scale 1:60,000. One inch to 5,000 feet. Two folded diagrams of sections.

612

NEWBERRY, J. S.—The Iron Resources of the United States. By J. S. Newberry.

This is Article III, pages 754-780 of the International Review, November-December, 1874.

613

NUTTALL, M.—A journal of travels into the Arkansas Territory during the year 1819. By M. Nuttall (?), 1821.*

614

OWEN, R.—A History of British Fossil Mammals and Birds. By Richard Owen, London. 1846.

The Missouri mastodon, discovered by Dr. Koch, and now in the British Museum, is figured on page 298, and is described on pages 290-298.

615

O'SULLIVAN & MORLEY.—Report of O'Sullivan & Morley, Engineers of the St. Louis & Iron Mountain Railroad Company. <Second Annual Report of the Directors of the Road. St. Louis. 1854.

616

PATTEN, J. H.—The Natural Resources of the United States. By J. Harris Patten, M. A. New York. 1881. 16°.

617

PEALE.—Lists and Analyses of the Mineral Springs of the United States. A Preliminary Study. Bulletin No. 32 of the Geological Survey. Washington. 1886.

This contains references to the mineral springs of Missouri on pages 164-170.

618

PEASE, G.—Brief Statements respecting Mineral Deposits in the States of Missouri and Illinois. [By Gales Pease.] Boston. 1839. 12 pp.

There is a map mentioned as accompanying this, but it is not found in the copy in my library.

619

PARKER, N. H.—The Missouri Hand-Book, embracing a full description of the State of Missouri; her Agricultural, Mineralogical and Geological character; her Water Courses, Timber Lands, Soil and Climate; * * * * * Location of Valuable Mines and Mineral Lands. * * * By Nathan H. Parker. * * * Saint Louis. P. M. Pinckard, Nos. 78 and 80 Pine Street. 1865. 12°, 162 pp. Map of the State.

620

— Missouri as it is in 1867: an Illustrated Historical Gazetteer of Missouri, embracing the Geography, History, Resources and Prospects, the Mineralogical, etc., etc. By Nathan H. Parker. Phil. 1867. 458 pp.

621

— Geological Map of Missouri, by Nathan H. Parker. 1865.

622

PARKER, S.—Journal of an Exploring Tour beyond the Rocky Mountains, under the direction of the A. B. C. F. M., performed in the years 1835, 36 and 37; containing a Description of the Geography, Geology, Climate and Productions, and the number, manners and customs of the natives. With a map of Oregon Territory. By Rev. Samuel Parker, A. M. Ithaca, N. Y. Published by the author. 1838.

His journey through Missouri is described on pages 20-34, but this part of the work contains very little geology.

The fifth edition was published at Auburn in 1846.

623

PERKINS, J. H. and PECK, J. M.—Annals of the West: embracing a concise account of principal events which have occurred in the Western States and Territories from the discovery of the Mississippi valley to the year eighteen hundred and fifty. Compiled from the most authentic sources for the projector. First edition. By James H. Perkins. Second edition, revised and enlarged, by J. M. Peck. St. Louis: Published by James R. Alback. Chambers & Knapp, Printers, 1851.

Account of the New Madrid earthquake. pp. 586-590. The account is partly from Dr. Hildreth. [See also Senator Linn's letter in Wetmore's Mo. Gazetteer, 132-142; Drake's Picture of Cincinnati; Flint's Recollections; American Pioneer, 1-129; Travels in the Interior of America, by John Bradbury. pp. 199-207.

624

PHILLIPS, J. V.—Report of J. Van Cleve Phillips, Geologist and M. E. on Reeds' Mineral Tract, located at Reeds, Jasper county, Missouri. Also Several Opinions of Distinguished Geologists and M. E.'s on Mineral Properties on said tract, etc. Carthage, Mo.

625

— Report on the Geology of the Mineral District contiguous to the Iron Mountain Railroad. By J. V. Phillips. St. Louis. 1859. 14 pp., map and section.

This contains a Geological map showing the mineral region contiguous to the Iron Mountain Railroad and its proposed extension, Surveyed by J. V. Phillips. Constructed and drawn by J. T. Fiala. St. Louis Mo. 1859. Scale 2 inches to 6 miles. The vertical section is through Iron Mountain and Pilot Knob from Greenville to Bailey's, 100 miles.

626

PHILLIPS, J. A.—A Treatise on Ore Deposits. By J. Arthur Phillips, F. R. S., with numerous illustrations. London. 1884.

Accounts of the Copper, Iron, Lead and Zinc of Missouri are given.

627

POST, G. T.—Report showing the Necessity, Feasibility and Prospects of the Central Missouri Railway. By the President. [Geo. T. Post.] October, 1885. 25 pp.

This describes the coal field along the line of the road.

628

POTTER, WM. B.—Report on the Cornwall Mine & Smelting Works at Ste. Genevieve, Missouri, by William B. Potter, E. M., Professor of Mining and Metallurgy at Washington University. Riverside Printing House, 302 N. Main St., St. Louis. 1882.

629

PROUT, H. A.—The Advantages of a Geological Survey of the State of Missouri. By H. A. Prout, M. D. St. Louis: Printed by W. B. Foster—Times Office. 1851. 29 pp.

630

PUMPELLE, R. et al.—Iron Ores of Missouri and Michigan. By Raphael Pumpelly, Late Director Geological Survey of Missouri; T. B. Brooks State Geologist Lake Superior Iron District; and Adolph Schmidt, Assistant in the Geological Survey of Missouri. With Illustrations in the Text, and Topographical and Geological Atlas. New York: G. P. Putnam's Sons. 1876. Part I, Geology of Pilot Knob and its Vicinity, by Raphael Pumpelly. Analyses of Iron-ores, Pig-irons, and Fuels, by Regis Chauvenet and A. A. Blair. Iron-ores of Missouri by Adolph Schmidt, Ph. D. Large 8°. 220 pp.

631

ROBINSON.—A Catalogue of American Minerals, with their localities: including all which are known to exist in the United States and British Provinces, &c. Boston. 1825.

This has 10 pages relating to Missouri minerals and localities.

632

ROEMER, F.—Ueber den Bau von Melonites multipora, ein Echinid des Amerikanischen Kohlenkalks. Von Dr. Ferd. Roemer, ord. Professor an der Universitat zu Breslau. 19 pp. <Archiv fur Naturgeschichte, von A. F. A. Wiegmann. Ein und zwanzigster Jahrgang. Erster Band. 1855. Pages 312-330. Taf. 1, figs. 1-6.

The specimen figured is a fine one from St. Louis.

633

SAMPSON, F. A.—Pettis county and Sedalia, Mo. Prepared by F. A. Sampson for the Immigration Committee of the Citizens' meetings. Sedalia, Mo. Press of H. Swalley. 1886. 16 pp. illustrations.

The geological and mineral account of the county is given on page 9.

634

SCHMIDT, A.—Ueber eine Umwandling des Hornsteins. By Dr. Adolf Schmidt. [Alterations of Hornstone.] Neues Jahrb. 1878. pp. 719-721.

Notices the hornstones of Southwest Missouri.

635

— Die Blei und Zink Erz-Lagerstatlen von Missouri, von Adolf Schmidt. Heidelberg. 1876.*

636

SCHOOLCRAFT, H. R.—A View of the Lead Mines of Missouri: including some observations on the Mineralogy, Geology, Geography, Antiquities, Soil, Climate, Population and Productions of Missouri and Arkansas, and other sections of the Western Country. Accompanied by three engravings. By Henry R. Schoolcraft. 299 pp. Plates. New York. 1819.

637

— Scenes and Adventures in the Semi-Alpine Region of the Ozark Mountains of Missouri and Arkansas which were first traversed by De Soto, in 1541. Philadelphia, Lippincott, Grambo & Co. 1853. 256 pp.

638

SCHOOLCRAFT, H. R.—Journal of a Tour into the Interior of Missouri Arkansaw, and from Potosi, or Mine a Burton, in Missouri Territory, in a Southwest Direction, toward the Rocky Mountains: Performed in the years 1818 and 1819. London. 1821. 102. pp. Map.

639

SEAMON, W. H.—Tallow Clays. By Prof. W. H. Seamon. <Scientæ Baccalaureus, A Quarterly Journal of Scientific Research, Published under the auspices of the Missouri School of Mines. Vol. 1. No. 1, June, 1890, pp. 36-40. 4°.

640

SHEPARD, C. U.—Report of Prof. Charles U. Shepard, of Amherst College, Mass., in relation to Mineral Lands in the counties of Madison, Wayne and Iron, in the State of Missouri, belonging to Hiram N. Tong, of Ironton, Iron Co., Mo., made by him after an examination of the premises, May 17, 1860. St. Louis: Printed by M. Niedner, No. 43 Pine Street, near Third St. 1860. 15 pp. With map of the Ironton Mining Company Lands.

641

SHUMARD, B. F.—Report on the Chouteau League Tract, or Spanish Mineral Land Grant, known as United States Survey No. 2066, in Washington County, Mo.; made by Prof. Benj. F. Shumard, Assistant State Geologist of Missouri, 1864. Supplemented by report on the same tract, now the property of the St. Louis Lead Mining Company. By N. W. Bliss, General Superintendent of said Company, at their works, at Kingston Furnace, Washington County, Mo., Dec. 1, 1872. St. Louis: Democrat Lithographing and Printing Company. 1873. 29 pp. 2 folded plates, 1 folded map, 1 folded plat of the mineral lands.

642

— A Geological Report on the old Mines Property of William Long, Esq., in Washington County, Missouri. By B. F. Shumard, M. D. Saint Louis: R. P. Studley & Co., Printers, Binders and Lithographers. 1867. 20 pp.

643

— A Geological Report on the Enloe Mining Property of Allen P. Richardson, Esq., in Crawford County, Mo. By B. F. Shumard, M. D. St. Louis: Missouri Democrat Print, cor. Fourth and Pine Sts. 1867. 12 pp. Folded map.

644

SINGLETON, W. R.—Report on Ste. Genevieve, Iron Mountain and Pilot Knob Plank road. By Wm. R. Singleton, Principal Engineer. *

645

SOPWITH, T.—The Missouri Lead Mining and Smelting Company, Limited. Reports. London. Doherty & Co., Printers, 6 Great Newport street, St. Martin's Lane, W. C. 1879. 14 pp. 4°.

This has report on mines in Franklin County by Thomas Sopwith, Esq., Memb. Inst. C. E., and also report by J. B. Champion.

646

STRECKER, W.—Das Zink-Huettenwesen in den Vereinigten Staaten von Nord Amerika. Von W. Strecker. <Berghutt Jahrb. Bd. XXVII, pp. 282–353, pl. V.

The zinc deposits of DeSoto, Missouri, are noticed.

647

SWALLOW, G. C.—The Pacific Railroad Company offers at public sale
* * * Farming, Timbered and Mineral lands. * * * St. Louis
Mo. 1859. 57 pp.

The pamphlet has extensive reports by Prof. Swallow on the minerals of the counties traversed by the road.

648

— The Hannibal & St. Joseph Railroad Company have received by grant from Congress 600,000 acres of the choicest Farming and Wood lands, etc., etc. Hannibal, Mo., Hannibal & St. Joseph Railroad office. 1860. 12°, 60 pp. Maps and illustrations.

This has an account of the geology and soils of Northern Missouri, by Prof. Swallow.

649

—Report on the Mineral Lands of Messrs. Woods, Christy & Co., and Messrs. Christy & Woods, in Franklin County, Missouri, by G. C. Swallow, 1866. St. Louis. McKittrick & Co., Printers, cor. Main and Vine. pp. 49. Maps.

650

SWALLOW, G. C.—Prospectus of the Northumberland Lead Mining and Smelting Company. Location of Mines: near St. Clair, Franklin County, Mo. Main office of Company: St. Clair, Missouri. 4to. 16 pp., folded section and folded map of Franklin County, with the mines of the Company. [1880.]

This has a report on the mine by G. C. Swallow, made in Oct. 1865, when he was State Geologist; also various other reports.

651

— Report of G. C. Swallow to Directors of Carlton & Randolph R. R. 1859. 10 pp. 2 maps. (*)

652

— Letter of G. C. Swallow to W. M. McPherson, Pres. of the Pacific R. R., on Lands and Minerals of S. W. Mo. 8 pp. n. d., but prior to 1860. (*).

653

— Report of G. C. Swallow on North Missouri R. R. 1866. 12 pp. (*)

654

— Geology. [Geological Sketch of the State of Missouri.] By Hon. G. C. Swallow, A. M., M. D., Professor of Geology, Agriculture and Botany in the University of the State of Missouri, and late State Geologist. <Campbell's New Atlas of Missouri. St. Louis, 1873, folio, pp. 106–116, with section of the Rocks of Missouri, and Geological map of Missouri.

655

— Physical Geography of Missouri. By Prof. G. C. Swallow, M. D., LL. D. I—Topography; II—Geology; III—Mines and Useful Minerals; IV—Rivers and Springs; V—Prairies; VI—Timber; VII—Soils. 36 pp. <Campbell's Gazetteer of Missouri. 1874.

This has a Geological map of Missouri.

656

— Physical Geography. Geology, Mines, Minerals, Waters, Prairies, Timber and Soils of Missouri, by G. C. Swallow, LL.D. Former State Geologist, now Professor of Agriculture in the State University. 40 pp. <Switzler's History of Missouri, Part III. 1879.

657

SWALLOW, G. C.—Physical Geography of Missouri. Geology, etc. By G. C. Swallow, LL.D. <The Commonwealth of Missouri. A Centennial Record. Edited by C. R. Barns. St. Louis. 1877; pp. 499-539.

658

TAYLOR.—Statistics of Coal. The Geographical and Geological Distribution of Mineral Combustibles or Fossil Coal, etc. Phil. 1848.

There is an account of the coals of Missouri on pages 169-171. The second edition, with additions by S. S. Haldeman, was issued in Philadelphia in 1855, and has a map with an account of the coals of Missouri on pages 484-487.

659

THOMPSON, R. O.—The Lead Deposits [of Missouri]. By R. O. Thompson, M. E. St. Louis. 15 pp. <Campbell's Gazetteer of Missouri. 1874.

660

— The Iron Deposits [of Missouri]. By R. O. Thompson, M. E. 10 pp. <Campbell's Gazetteer of Missouri. 1874.

661

THOMPSON, H. O.—Missouri Pottery Clays. By Hugh O. Thompson, St. Louis. 3 pp. <Campbell's Gazetteer of Missouri. 1874.

662

VON GRODDECK, A.—Die Lehre von den Lagerstaetten der Erze. Ein Zweig der Geologie. Von Dr. Albrecht Von Groddeck, Bergrath und Director der Konigl. Preuss. Bergacademie und Bergschule in Clausthal. Mit 119 Abbildungen in Holzschnitt. Leipzig. Verlag von Veit & Comp. 1879.

This has accounts of the Iron Mountain on pages 145 and 267, and of the lead region on p 237 et seq.

663

VOGDEN.—Notes on the Distribution of Iron Ores in the United States, Compiled from various Geological Reports. Fort Monroe, Virginia. Printed at the United States Artillery School. 1886. Sq. 8°. 24 pp.

This has "Missouri. Geological position of the Iron Ores." 4 pp.

664

WALKER, C. B.—The Mississippi Valley, and Prehistoric events: giving an account of the original formation and early condition of the great valley; of its vegetable and animal life, of its first inhabitants, the mound builders, its mineral treasures and agricultural developments. All from authentic sources. By C. B. Walker. R. T. Root, Publisher, Burlington, Iowa. 1879. 539 pp.

There are several chapters on the geology and minerals of the valley.

665

WETMORE, A.—Catalogue of Minerals [in Missouri]. 5 pp. <Gazetteer of the State of Missouri. By Alphonso Wetmore. St. Louis. 1837.

There are also accounts of minerals, etc., in several counties of the State.

666

WHITNEY, J. D.—The Metallic Wealth of the United States, described and compared with that of other countries. By J. D. Whitney. Phil. 1854.

Accounts of the Missouri Copper ores, pp. 310-312; Lead, pp. 417-421; and Iron, pp. 478-481.

667

WILBER, C. D.—Mineral Wealth of Missouri. Two Lectures Delivered in the Hall of Representatives, at Jefferson City, Missouri, Feb. 17th and 18th, 1870. By Prof. C. D. Wilber, Instructor of Mining Lands. 5th Thousand. St. Louis, 1870. 67 pp.

These lectures were also published in the Agricultural Reports of Missouri.

668

WILSON, L. A.—Wilson's History and Directory for Southeast Missouri and Southern Illinois. * * * * * Compiled and Published by L. A. Wilson, Cape Girardeau, Mo. 1875-76.

This has a catalogue of the lead mines of that part of the State that were worked in 1818, as well as statistics of later date.

669

WILSON, J. N.—Lead and Zinc Ore of Southwest Mo. Mines. Authenticated Statistics. The Output of Lead and Zinc Ores from this Mining District for the year ending March 1st, 1887. By John N. Wilson, Carthage, Missouri, with contributions by F. L. Clerc and Thos. N. Davey. Printed at office of Jasper County Democrat, Carthage, Missouri. 32 pp.

670

WORTHEN, A. H.—Catalogue of American Paleozoic Fossils, the collection of Prof. A. H. Worthen, deceased, Late State Geologist of Illinois. Collected and purchased by him during fifty years of active life. Embracing 5,071 fine specimens, of which 752 are Types, and of these 240 are Crinoids, etc., etc. Warsaw, Illinois. 1889.

The catalogue contains 81 species of Missouri specimens, and of these 73 types.

671

WRIGHT, F.—The Ice Age in North America and its Bearings upon the Antiquity of man. By Frederick Wright. New York. 1889.

There are accounts of the glaciated area in Missouri on pp. 144, 213, 367 and on other pages.

MINERAL SPRINGS PUBLICATIONS.

These publications all contain analyses of the mineral waters.

672

BLUE LICK.—Blue Lick Springs, Saline County, Missouri. A Remarkable Group of Mineral Waters, Forming Nature's Own Sanitarium. Marshall, Mo. 32 pp. 5 ills.

This has an account of the coal, lead and other minerals of the county, taken from an article by Col. L. D. Burch, of Chicago, editor of the *American Sheep Breeder*.

673

EL DORADO.—El Dorado Springs, Cedar Co., Mo. Its History, Geography, Geology and the Therapeutics of its Waters. Sedalia, Mo. 12 mo. 30 pp. Small map. 4 ills.

The pamphlet is by Prof. P. Schweitzer of the State University. The analyses are by him, and also the account of the geology of Cedar County.

674

EL DORADO.—The Famous El Dorado Springs. The Great Health and Pleasure Resort of Southwest Missouri. Bazoo Print, Sedalia, Mo. 12 mo. 48 pp.

The analysis is by Prof. W. Wishon of the School of Mines at Rolla.

675

EXCELSIOR.—Excelsior Springs. A Description of the Marvels of a Pleasant Valley. * * * Issued by the Passenger Department of the Wabash Railroad. St. Louis, Mo. 1889. 22 pp. 8 ills. Small map.

676

PARIS CHALYBEATE.—Paris' Chalybeate Springs, Lawrence County, Mo. Health Resort. E. G. Paris, Proprietor. April, 1889, Springfield, Missouri, 12 pp., 16°.

677

PERTLE.—Pertle Springs, Warrensburg, Mo. Season of 1888. Their great advantages as a health and pleasure resort . . . By Incognito. Warrensburg, Mo. 1888. 24 pp. 12 mo. 3 ills.

The analysis is by Dr. C. M. Riley of St. Louis.

678

SWEET.—Sweet Springs, Saline County, Mo. . . St. Louis. 1882. 12 mo. 32 pp. 7 ills. Map.

This was issued by the Missouri Pacific Railroad. The analyses are by Dr. Charles P. Williams, Director of the Missouri School of Mines.

679

— Sweet Springs, Saline County, Mo. Season of 1886. D. W. Marmaduke, President. Leslie Marmaduke, Secretary. J. W. Hall, Lessee of Hotel. Sedalia. 12 mo. 32 pp. 14 ills. Map.

The analyses are the same as in the preceeding. The edition of 1887 contains 36 pp.

680

— Summer & Winter Health & Pleasure Resorts. [Issued by the Missouri Pacific Railway Company, 1888.] 12°. 144 pp. Illustrations.

Under the head of Summer Resorts, pp. 35-53, the following mineral springs are described, analyses of the waters of most of them being given: Windsor Springs, near St. Louis; McAllister Springs, Saline county; Aurora Springs, Morgan county; Sweet Springs, Saline county; Blue Lick Springs, Saline county; Pertle Springs, Warrensburg, and El Dorado Springs, Cedar county.

COUNTY HISTORIES.

681

ANONYMOUS.—Geology, Physical Features, etc. [of Missouri.] pp. 12-39. Physical Description, Geology, etc., of Southeast Missouri. pp. 197-220. New Madrid Earthquake region. pp. 304-308. <History of Southeast Missouri, embracing an Historical Account of the Counties of Ste. Genevieve, St. Francois, Perry, Cape Girardeau, Bollinger, Madison, New Madrid, Pemiscot, Dunklin, Scott, Mississippi, Stoddard, Butler, Wayne and Iron, and including a department devoted to the preservation of personal, professional and private records. Illustrated. Chicago. The Goodspeed Publishing Co. 1888.

Quite interesting and full histories and descriptions of the mines in the counties named are given in the second article. It is said to have been written by a Mr. — Wheatley, who since died at Ft. Smith, Ark. The first article is also found in other volumes issued by the Goodspeed Publishing Co.

County histories issued by the same publishing company are: "History of Laclede, Camden, Dallas, Webster, &c. Counties. 1889." "History of Cole, Moniteau, &c. Counties. 1889." "History of Franklin, &c. Counties. 1888."

682

— Natural History, Geology, etc. (of Missouri). 12 pp. <History of Johnson County, Missouri. F. A. North. Chapter III, pp. 192-203. 1881.

683

— Geology and Minerals (of Missouri). 20 pp. <History of Pettis Co., Missouri. F. A. North. pp. 66-85. 1882.

684

— Geology of Missouri. 6 pp. <History of Jasper County, Missouri. F. A. North. Chapter II, pp. 18-23. 1883.

685

— Geology of Missouri. <History of Greene County, Missouri, written and compiled, &c. Illustrated. St. Louis: Western Historical Company. 1883. Chap. III, pp. 13-20.

686

ANONYMOUS.—Geology of Missouri. 8 pp. <History of Audrain County, Missouri. National Historical Company. Chapter III, pp. 13-24.

The same article is contained in other county histories issued by the same company, as "History of Callaway County. 1884." "History of Caldwell and Livingston Counties. 1886." "History of Howard and Cooper Counties. 1883."

687

— History of Cole, Moniteau, &c. Counties. The Goodspeed Publishing Co. 1889.

The geology of the counties is given as follows:

Cole, p. 204; Moniteau, p. 311; Morgan, pp. 394-401; Benton, pp. 453-459; Miller, pp. 527-528; Maries, pp. 584-586; Osage, 629-630.

688

— History of Laclede, Camden, etc., Counties. The Goodspeed Publishing Co. 1889.

The geology of the counties is given as follows:

Laclede, pp. 13-18; Pulaski, pp. 97-100; Webster, pp. 166-170; Camden, pp. 279-284; Wright, pp. 355-359; Texas, pp. 426-429; Dallas, pp. 493-498; Dent, pp. 564-566; Phelps, pp. 622-627.

689

— History of Franklin, Jefferson, etc., Counties. The Goodspeed publishing Co. 1888.

The geology and mineralogy of the counties are given as follows:

Franklin, pp. 206-214; Jefferson, pp. 364-369; Washington, pp. 459-461; Crawford, pp. 537-543.

690

— Physical and Geological Features. 7 pp. <History of Howard and Cooper Counties. Chap. XVI, pp. 320-326.

691

BROADHEAD, G. C.—Geology of Bates County. <History of Bates County. (*)

692

MATHEWS, D.—Natural History of the County, including its Topography; its Hydrography; its Geological Formations, etc. By D. Mathews. 12 pp. <History of Jasper County, Missouri. F. A. North. Chap. II, pp. 137-150. 1883.

693

SAMPSON, F. A.—The Natural History of the County, including its Geological Formations; its Paleontology; its Conchology; its Botany, etc., with Partial Lists of Distribution of Species. By F. A. Sampson. 19 pp. <History of Pettis County, Missouri. F. A. North. Chap. III, pages 221-239. 1882.

694

SWALLOW, G. C.—Geology of Greene county. By Geo. C. Swallow, LL.D. <History of Greene County, Missouri. Western Historical Company. 1883. Chapter XVII, pp. 573-575. Portrait of G. C. Swallow.

COUNTY ATLASES. FOLIO.

695

ANONYMOUS.—History of St. Francois County. <Historical Atlas of the World. Higgins Bro. & Co. Publishers. Chicago. 1882.

This gives large views of the St. Joe Lead Mines, the Desloge Lead Co. Mines, both at Bonne Terre, and the Syenite Granite Quarries at Syenite.

696

— Geology of Cooper Co., Mo. <Illustrated Atlas Map of Cooper County, Missouri. St. Louis Atlas Publishing Co. 1877.

697

— Geological Formation and Mineral Resources of Greene Co., Mo. <An illustrated Historical Atlas Map of Greene County, Mo. Brink, McDonough & Co. 1876.

APPENDIX.

The following titles were not obtained in time to be inserted in their proper order.

AGE OF STEEL, St. Louis.

(A partial list.)

698

EDITORIAL.—(Table showing the production of pig iron in Missouri from 1872 to 1884.) <Vol. LVII, No. 9, Feb. 28, 1885.

699

— Spelter and Lead. <Vol. LIX, No. 13, March 13, 1886.

Shows receipts and shipments of lead and zinc at St. Louis, and over what roads received.

700

THOMPSON, H. M.—Missouri Tin Mines. By Hugh M. Thompson. <Vol. LIX, No. 13, March 27, 1886.

701

— A Missouri Lead Mine. By Hugh M. Thompson. <Vol. LIX, No. 22, May 29, 1886.

An account of the St. Joe Lead Mine at Bonne Terre.

DE BOW'S REVIEW.

(A partial list.)

702

ANONYMOUS.—Lead Mining in Southern Missouri. (From the Western Journal.) <Vol. XVIII, O. S., March, 1855, pp. 389–391.

703

EDITORIAL.—Great Cities of the West—St. Louis. <Vol. XVI, O. S., April, 1854, pp. 397–410.

Notices the mineral regions within reach of St. Louis.

704

—The State of Missouri. Immigrants—Mineral Wealth—Coal, Soil, Productions, Public Lands, Tobacco, Hemp, Vineyards, Timber, Grasses, etc., etc. <Vol. 2, No. 5, Nov. 1866, pp. 481–489.

ENGINEERING AND MINING JOURNAL.

705

The first two volumes of this journal were published in 1866, and there have been two volumes each year since, so that the year of any volume can readily be found when not given. The titles from the first seven volumes, and a few of those from the succeeding volumes, up to the twenty-seventh, were copied at the office of publication in New York, and were not seen by the compiler.

706

ANONYMOUS.—Missouri's Rank as a Mining State. <Vol. 1, p. 42. 1866.

707

—Lead. <Vol. II, pp. 342, 374.

An account of a trip to Potosi, with a description of the geology of the lead fields.

708

—Missouri Iron and Indiana Coal. (Copied from *Mississippi Valley Review* of April 16, 1870.) <Vol. IX, pp. 276 and 291.

709

—Caves in the Ozark Mountains. Explorations by a party from St. Louis—a voyage up a subterranean river—a forest of stalactites. (Copied from the *St. Louis Republican*.) <Vol. X, p. 152.

710

—The New Cornwall in Missouri. (Copied from *United States Railroad and Mining Register*.) <Vol. X, pp. 298–299.

711

ANONYMOUS.—The Tin Mines of Missouri. (Communication signed "Missouri.") <Vol. XIII, p. 56.

712

— Zinc in Missouri. (Copied from *St. Louis Railway Gazette*.) <Vol. XVIII, pp. 37-38.

713

— The Zinc Mines in Dade County, Mo. (From *Mines, Metals and Arts*.) <Vol. XVIII, p. 371.

714

— Southwest Missouri lead interest—a proposed lead combination. (Correspondence signed B.) <Vol. XXV, p. 73.

715

— Missouri lead smelters. (Correspondence signed B.) <Vol. XXV, p. 91.

716

— Missouri Minerals. (Correspondence signed B.) <Vol. XXV, pp. 276-277.

717

— Old Granby Mines, Newton County, Missouri. (Correspondence signed B.) <Vol. XXV, p. 406.

718

— Silver in Missouri. (Special correspondence.) <Vol. XXV, pp. 310-311.

This is an account of the Einstein Silver Mines in Madison County.

719

— Missouri Mining News. (Special correspondence.) <Vol. XXV, pp. 311-312.

This also has an account of the Einstein Silver Mines.

720

— The lead interests of the Mississippi Valley. (Special correspondence.) <Vol. XXV, p. 55.

721

— Lead Phantom. (Special correspondence.) <Vol. XXVI, pp. 57, 93.

Has an estimate of the bulks of lead and zinc in mines and dumps.

722

ANONYMOUS.—Concentrating ores in Southwest Missouri. Written for the Engineering and Mining Journal. <Vol. XXXV, (1883), p. 207.

723

— Missouri steel to the Mahoning Valley; or, "Coals to Newcastle." (Special Correspondence, signed "Veritas.") <Vol. XL, (1885), p. 94.

724

— The mineral resources of Joplin, Mo. <Vol. XLIX, (1890), p. 286.
The history, geology and production of the Joplin mines are given.

725

BEAUREGARD, Hy. M.—Missouri Tin. By Hy. M. Beauregard. Correspondence, with comments. <Vol. VII, p. 277.

726

— Missouri Tin Assays. Correspondence. <Vol. IV, p. 407.

727

BERGEN, J. Y.—The construction and operation of Slag-hearths. By J. Y. Bergen, Jr. <Vol. XIX, pp. 269-271.

Shows the results as obtained in Missouri lead mines.

728

BROADHEAD, G. C.—The Southeast Missouri lead district. By G. C. Broadhead, Pleasant Hill, Mo. (Read before the Am. Inst. of Mining Engineers.) <Vol. XXII, pp. 59-60.

729

CLERC, F. L.—The mining and metallurgy of zinc in the United States. By F. L. Clerc. (From Mineral Resources of the United States. <Vol. XXXVI, (1883), pp. 148-151, 168-169 and 180-181.

"The Lead and Zinc Region of Southwest Missouri" is a part of the article.

730

— The Lewis-Bartlett process as applied at the Lone Elm works, at Joplin, Mo. Written for the Engineering and Mining Journal, by F. L. Clerc. <Vol. XL, (1885), pp. 4-6, 3 illustrations.

73¹

CLERC, F. L.—Mineral resources of Joplin, Mo. Communication from F. L. Clerc. <Vol. XLIX, (1890), p. 308.

73²

ELLIOTT, R. S.—Iron in Missouri. Extract from address of R. S. Elliott before the members of the Legislature. Copied 'from Bulletin of the American Iron and Steel Association. <Vol. X, p. 120.

733

FLETCHER, F. H.—The Mineral Resources of Missouri. By Frank H. Fletcher. <Vol. I, p. 260; Vol. II, p. 261, 407; Vol. III, pp. 41, 48, 147, 190; Vol. IV, p. 2.

734

— The Thomas Mines. <Vol. III, p. 147.

735

GAGE, J. R.—On the Occurrence of the Lead Ores in Missouri. By James R. Gage, M. E. (Read before the Am. Inst. of Mining Engineers.) <Vol. XVIII, pp. 194 and 209-210, illustrated.

73⁶

GENTH, F. A.—Tin Mines in the United States. By F. A. Genth. <Vol. IX, p. 322.

737

— Explanation of the discrepancy in assays of tin ores in Missouri. <Vol. X, p. 378.

73⁸

GOULDING, T. R.—Treatment of Tin Ores in Missouri. Their Value—Assays. By T. R. Goulding. <Vol. IV, p. 329.

739

HEWITT, A. S.—A Century of Mining and Metallurgy in the United States. Centennial Address of Hon. Abram S. Hewitt, President elect of the American Institute of Mining Engineers, Philadelphia, June 20, 1876. <Vol. XX, pp. 609-615.

74⁰

JULIEN, A. A.—The origin of crystalline iron ores. (Abstract of Dr. Alexis A. Julien's paper before the New York Academy of Sciences.) <Vol. XXXV, (1883), p. 207-8.

The Huronian hematites of Lake Superior and Missouri are described.

741

KROM, S. R.—St. Joseph Lead Company's Dressing Works at Bonne Terre. Communication from S. R. Krom, New York. <Vol. XLVIII, (1889) p. 3.

This is a criticism of some points in the paper of Prof. Munroe in the preceding volume.

742

MERRILL, W. E.—Report on Missouri Tin Ores, by Col. W. E. Merrill, U. S. Army. <Vol. IV, p. 373.

743

Mining and Mineral items.

Vol. I—

Missouri lead. In Vol. I, pp. 185, 201, 218, 234, 250, 279, 295, 327, 343, 359, 394, 410.

Coal in Missouri, p. 54.

Carroll County oil well, p. 21.

Other items, pp. 186, 210, 292, 309, 363.

Vol. II—

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Iron, pp. 310, 341.

Other items, pp. 68, 82, 117, 213.

Vol. III—

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Iron, pp. 109, 227.

Vol. IV—

Missouri tin discovered by Dr. Koch, pp. 69, 101, 106, 120, 138, 265.

Tin ore in Southeast Mo., p. 37.

Notice of Waterhouse's Resources, p. 73.

Other items, pp. 149, 164, 180, 277, 403.

Vol. V—

Mining items, pp. 261, 293.

Vol. VI—

Silver lead in Madison Co., p. 27.

Copper fields in Missouri, p. 307.

Other items, pp. 117, 228-9, 356, 403.

Vol. VII—

Lead in Missouri, p. 232.

Other items, pp. 21, 84, 356-357, 373, 389, 403.

Vol. VIII—

Missouri tin mines, p. 25.

Mining items, p. 103.

Coal measures of the Southwest, p. 405.

Vol. IX—

Lead, iron and coal, p. 293.

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- Zinc and iron, p. 389.
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 - Mining in Southeastern Mo., p. 357.
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 - American lead mines, p. 105.
 - Other items, pp. 37, 53, 69, 100, 101, 280.
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 - Notice of Hagar's Report, p. 121.
- Vol. XII—
 - Missouri Zinc Manufacture, Editorial, p. 25.
 - Missouri tin mines, Editorial, p. 228.
 - Missouri iron ores, p. 151.
 - Remarkable lead deposit, pp. 235-236.
- Vol. XIV—
 - Nickel at Mine LaMotte, pp. 98-99.
- Vol. XV—
 - Lead Miners and Smelters' Ass'n, p. 282.
- Vol. XVI—
 - Missouri iron ores, p. 187.
- Vol. XVIII—
 - Another Iron Mountain in Mo., p. 19.
 - Granby Lead mines, p. 19.
 - Notice of *Southwest Missouri Mines*, p. 166.
 - Notice of Broadhead's Reports, p. 405.
 - Schmidt's report on iron ores, p. 324.
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 - Washington county zinc mines, p. 541.
 - Production zinc ores in 1875, p. 179.
- Vol. XXII—
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 - Webb lead mines, p. 141.
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 - Zinc and lead, p. 302.
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- Vol. XXIV—
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 - Joplin white lead works, p. 394.

Mining and Mineral items.

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Vol. XXVIII—

The Silver mines of Southeastern Missouri, p. 8.

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ERRATA

- No. 47—For House Journal read Senate Journal, and add, in House Journal, Appendix, pp. 180-192.
57—For 24th read Adjourned Session, 23d Gen. Ass'y, 1866.
102—For 1885 read 1883.
114—To "Eighteenth Report" add 1884.
155—For F. A. Clerk read F. L. Clerc.
241—For Vol. XVI read Vol. XVII.
245—The date given is of the meeting. The publication was 1889.
310—For Vol. XLII read XLIII.
326—The date of publication was 1882.
357—Add date 1862.
362—Add date 1880.
363—Add date 1882.
364—Add date 1883.
365—For *magnlficus*, in line next to the last on page 82, read *magnificus*.
367—The date of publication was 1887.
403—For F. A. Clerc read F. L. Clerk [F. L. Clerc].
462—In the blank after Vol. read IV.
490—In the third line from bottom of page 104, read *P. Copoerensis*.
573—For "Bauman" read "Bannan."
661—For Hugh O. Thompson read Hugh M. Thompson.

The first fifty volumes of the American Journal of Science are referred to simply by the number of the volume. Later volumes give the series, as well as the volume. The first fifty volumes are sometimes referred to as First Series. The second fifty were published as the Second Series. The succeeding volumes are the Third Series.

